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SANITARY STATE OF THE ARMY

F. NIGHTINGALE

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OBSERVATIONS

ON THE EVIDENCE CONTAINED IN

THE STATIONAL REPORTS

SUBMITTED TO HER BY THE ROYAL COMMISSION ON THE

SANITARY STATE OF THE ARMY IN INDIA.

110081

BY

FLORENCE NIGHTINGALE.

146 a/

(REPRINTED FROM THE REPORT OF THE ROYAL COMMISSION.)

LONDON:
EDWARD STANFORD, 6 CHARING CROSS, S.W.
1863.

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LONDON
PRINTED BY SPOTTISWOODE AND CO.
NEW-STREET SQUARE

INTRODUCTION.

THE Royal Commission on the Sanitary State of the Army in India, presided over successively by Lord Herbert and Lord Stanley, procured an elaborate series of written evidence from all the principal Stations of India.

The questions of the Commissioners, with answers signed by the Commanding, Engineering, and Medical Officers, are printed in detail in a folio volume.

These Stational Returns were placed, in manuscript, in the hands of Miss Nightingale, who, after examining them by the light of her practical experience in the East—in hospitals, in barracks, and in the field—addressed the following observations on them to Lord Stanley.

The Royal Commission inserted the observations in the Appendix to their Report, with this remark: 'We have given an Abstract of the Stational

Reports, *and a valuable paper of comments on those Reports, contributed, at the request of the Commission, by Miss Nightingale*' (Report, folio, p. v.)

On a subject of the highest interest to the country, it appears desirable that Miss Nightingale's views should be placed in the hands of the public, both in England and in India.

Those who have Miss Nightingale's other volumes will thus be able to add to them a book which is second to none of them in charm of style, and will promote the reform of the sanitary condition of the British Army, as well as conduce to the well-being of the natives of India.

THE PUBLISHER

OBSERVATIONS.

My Lord,

In compliance with the request sent to me by the Royal Commission on the Sanitary State of the Army in India, in a letter of 11th October 1861, that I would make on the contents of certain MS. replies to printed queries addressed to all Indian military stations any observations which might occur to me as bearing on the sanitary condition of cantonments and hospitals, I beg to transmit the following. In doing this, the difficulty of giving what everyone might consider a fair representation of questions of such extent, by stating specific cases, has been great. Some will see no importance to health in the facts. Some will think the facts given the exception and not the rule. If there be an exception, i.e. if there be a single station in India with a good system of drainage, water supply, and cleansing for itself and its bazaars, with properly planned and constructed barracks and hospitals, provided with what is necessary for occupation and health—a station where the men are

not encouraged to drink, and where they are provided with rational means for employing their time—to such a station these remarks do not apply. But I have not found it. Everywhere there are grievous sanitary defects, which, wherever they exist, can lead only to sickness and loss of life to the degree in which they exist. And let those who doubt whether this representation is true, taken as a whole, look at the stational reports for themselves.

In the papers sent me I find an amount of evidence showing the causes of disease in the Indian army, such as perhaps was never before brought together on any similar subject. It is shown in these papers that:—

I. Indian Stations are subject to the Diseases of Camps.

The prevailing diseases at Indian stations are zymotic diseases, connected with camps,—such as I myself have seen,—all of them, cholera, fevers, diarrhœa, dysentery; together with hepatic disease.

The main point of the Indian sanitary question is, indeed, camp disease, the causes of which are rendered more intense by climate; and liver disease, occasioned to a great extent by over eating and over drinking, and sedentary habits, the result of these habits being, as in the former case, intensified by climate.

Stations have been chosen with as little regard to health as camps often have been. Many are in

positions which the mere verbal description proves to be unsuitable. Or, at all events, little or nothing appears to have been done to render them suitable. They are low, damp, or even wet, often mixed up with unhealthy native towns and bazaars abounding with nuisances.

II. Indian Stations present the same Sanitary Defects as Camps.

At all or nearly all the stations the usual causes of camp disease appear to exist. I will give examples of the more important of these as shortly as I can, as they exist at the larger British stations. These are:—

(1) Bad water.
(2) Bad drainage.
(3) Filthy bazaars.
(4) Want of ventilation.
(5) Surface overcrowding in barrack huts and sick wards.

(1) *Bad Water.*

Hyderabad (in Scinde) says 'No doubt it (the 'water) *swarms* with animal life.'

Where tests have been used, the composition of the water reads like a very intricate prescription, containing nearly all the chlorides, sulphates, nitrates, and carbonates in the pharmacopœia, besides silica and large quantities of organic matter

(animal and vegetable), which the reports apparently suppose to be nutritive, for few of them but 'consider' the water 'good' and 'wholesome;' e.g. Fort William, Calcutta, says that the water for cooking, drinking, &c., is carried from a tank *filled by surface drainage*, which tank is kept 'perfectly clean,' and is 'generally free' from 'surface impurities.' Many '*city* tanks are in a most filthy condition, producing 'malaria.' Sealkote calls its water 'decidedly good,' while containing a considerable portion of sulphate of lime. Ghazeepore calls its water 'good and 'sweet,' and says that it 'does not seem contami-'nated by the amount of leaves that necessarily fall 'into open structures.' Chunar says that its water is clear, sweet, and inodorous 'if allowed to settle 'before it is drunk.' Agra's water is 'laxative,' and 'apt to disagree *at first*.' Dinapore admits that its wells have been poisoned by infiltration from barrack privies. Nusseerabad says, 'The flavour (of the 'water) varies according to the quantity of the 'salts.' At Murree the quality is 'considered 'inferior by native visitors, and to cause colic.' 'Boiling' and filtration through sand and charcoal are necessary to 'render it wholesome.' At Hazaree-baugh tank water, 'on standing, copiously deposits,' and contains 'organic matter in considerable quan-'tity.' Its well water for domestic use contains silicic, phosphoric, hydrochloric, and carbonic acids. But it is satisfactory to know that 'persons *particular* 'about the quality of their drinking water' can 'obtain their supply' from 'several good wells.'

At Bangalore, the Ulsoor tank, used for drinking, is the outlet for the whole drainage of a most filthy bazaar (125,000 inhabitants); for that of our cavalry, infantry, and horse artillery barracks, and of the greater proportion of the station. The commander-in-chief says, 'the disgustingly filthy 'nature of the source, from which the water used 'at Bangalore is taken, has been brought to notice 'scores of times by me within the last 4½ years; 'but, as usual, nothing has been done to remedy 'this most crying evil.' Even the wells from which drinking water is taken are impure from sewage. They are open; and 'when they get dirty are 'cleaned.'

At Secunderabad, as much as 119 grs. of solid matter, and, as it would appear, 30 grs. of organic matter per gallon, are found in some of the well and tank water. [Secunderabad and Poona are almost the only stations which give a chemical analysis.]

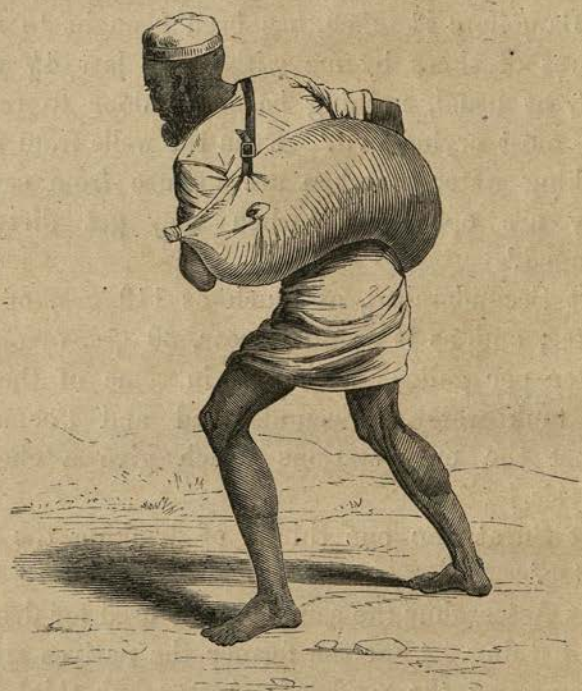
At Surat 'no one thinks of drinking the camp 'water.'

At Asseerghur the same tank is used for drinking and bathing. 'For the former the natives slightly 'clear away the surface.' Asseerghur thinks that its water '*smells* good.'

The application of chemical science to water supply appears hardly to be in its infancy in India.

The arrangements for raising and distributing water are everywhere, as Bombay Presidency

remarks, the same as what they might have been '1,000 years or more ago.' Belgaum has attained the maximum of civilisation under this antique system. The water is there 'raised in leather skins 'by bullocks, emptied into troughs, and thence 'conveyed by water-carriers.'



BEGINNING OF WATER PIPE.*

* Words convey such an imperfect idea of the actual state of things, that I obtained, by the great kindness of an Indian friend, illustrations taken from the life, which I have had cut in wood and transmit with this paper. I have also had woodcuts prepared of barrack and hospital plans, from drawings contained in the papers sent me.

At Kirkee 'no such a thing as a pump is known;' Government pays 617 rupees per (hot) month to water-carriers.

END OF WATER PIPE.

Everywhere 'each individual has his bheestie, and each regiment its set of bheesties.'

These water-pipes with a will are not always found to answer, for Fort William (which pays them 134*l.* per annum) admits that they sometimes take the water from 'nearer and impurer sources.' Would it not be better to try water-pipes without a will?*

* The reason usually assigned for employing these human water-pipes in barracks is, that they are indispensable on field service. But so are tents; and yet nobody proposes to barrack

It is singular that, while describing water sources, qualities, and modes of distribution which civilised cities have ceased to use, most of the reporters consider the water as good and fit for use. The practical result of this part of the evidence is that safe water supplies are yet to be found both for Indian cities and for British cantonments; and that many sources, as described in the returns, would in England be scouted as infallible causes of cholera in epidemic seasons.

Lavatories.

As for all means of cleanliness, bathing, except in a few cases where there are plunge baths, seems to mean washing the face, or throwing water over the body, for where there are lavatories there are no or few fittings, where there are fittings there is no water.

At Lucknow a small canal runs along the bath room, from which the bathers draw the water and throw it over themselves, being prevented by iron bars across from 'lying at full length in it and

men in tents in time of peace. Barracks are built for peace, and ought to be supplied with reasonable and decent conveniences. Why should the bheestie and waterskin be preserved when the tent is abandoned? Let the bheestie be for field service, if no better device can be discovered; but let some civilised method be adopted of supplying barracks, garrisons, and towns with this prime element of health and cleanliness. Besides, human labour is daily becoming of higher value in India, and it may be actually more expensive to use men as beasts of burthen now than to use the appliances of civilisation.

'soiling the whole supply.' The bath at Meean Meer is a long shallow tank, 'in which the man can lie 'down and bathe.'

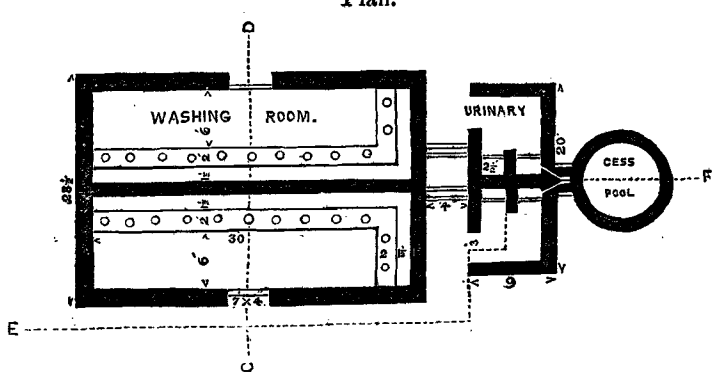
Madras and Wellington are literally the only stations where anything like lavatories and baths, with proper laying on of water and proper draining it off, is known, either in barrack or hospital. But at St. Thomas' Mount, and at many other stations, each lavatory is a tub filled by a bheestie, in which all the men wash, there being no basins.

Fig. 1. gives a plan, elevation, and section of a lavatory at Aden, which affords rather a favourable specimen of the kind of accommodation provided. It will be observed that all the refuse water is conveyed into a built cesspit, 8 feet deep, from which it is expected to 'make away with itself,' as it best can. Why cannot civilised basins be provided for men to wash in and the foul water be properly drained away?

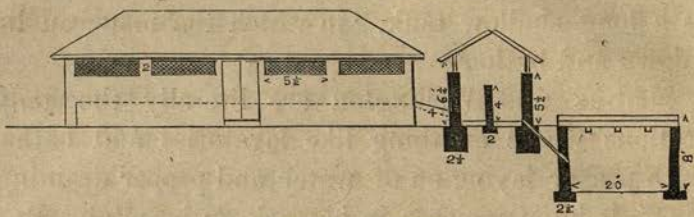
Fig. 1.

LAVATORY. ADEN.

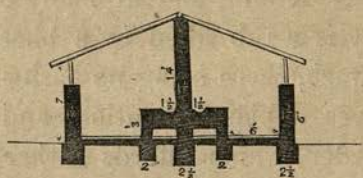
Plan.



Longitudinal Section.



Section on C.D.



Washing and bathing in barracks and hospitals will have to be conducted on quite a different scale from the present in India, if health and cleanliness are aimed at. If the facilities for washing were as great as those for drink, our Indian army would be the cleanest body of men in the world.

(2) *Bad Drainage.*

This may be rendered NO drainage whatever, in any sense in which we understand drainage. The reports speak of cesspits as if they were dressing rooms. As at Nusseerabad and Kolapore, 'a small 'cesspit is attached to each bathing room, urinal, or 'privy,' and 'to each married man's quarter there is a 'bathing room with cesspit.'

At the capital of the Bombay Presidency, where civilisation has introduced a 'main drain' 2 feet square, with a 'flat bottom,' this 'main drain' is a 'great nuisance,' and the 'stench at times scarcely

'to be endured.' At Fort George, in Bombay, the 'latrines are not drained except into an open ditch, 'which is always in a foul state.'

Indeed, Bombay would gladly say, as the London woman said when asked to point out the drains, in the days when London drainage was in a similar state, 'No, thank God, sir, we have none of them foul 'stinking things here.'

At Madras (Fort St. George) the drainage hitherto is stated to be worse than useless. The main drain of the town is 80 yards distant from the European fort; the effluvia from it very offensive. The arrangements at the native lines, as described in the reports, are simply abominable. The old privies in Fort St. George are 'as bad as they well could be.'

At Bellary, a large station, there is no drainage except the fall of the ground.

At Secunderabad (Trimulgherry) there is no drainage of any kind. The fluid refuse evaporates or sinks into the subsoil. A nullah which intersects the cantonment stinks. The extent of the cantonment is so enormous, that it is said 'to preclude any general 'surface draining,' a statement which, if true, would amount to this, that the occupation of ground by human beings must inevitably lead to disease; a statement as applicable, or rather much more applicable to the area of London than to that of Secunderabad, and yet London is drained both on the surface and below it.

Everywhere the system of 'drainage' is that 'cesspits' are 'emptied' when 'filled,' or 'when 'necessary,' and their contents carried away by hand,

as at Deesa and Belgaum. Generally they are close to the buildings.

At Hyderabad, in Scinde, in the native lines, the contents of the cesspits are 'thrown about in close 'vicinity to the cesspits.' 'Anything edible is imme-'diately picked up by birds or dogs.' There is 'great 'room for reform' in the native latrines, the cleansing of which consists mainly in the liquid 'sinking into 'the subsoil, so that the earth is thoroughly saturated, 'and a *noisome odour pervades* the atmosphere.' And yet it is added that the sanitary condition of the station is, 'in every respect, satisfactory.'

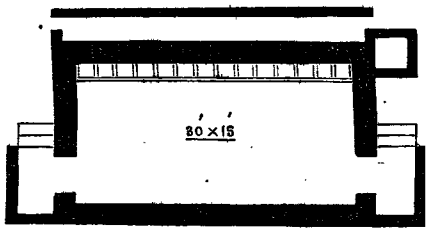
At Neemuch the 'drainage of privies and urinals 'is only on the surface.'

Often, as at Aden, it is expressly stated that it (viz. 'all drainage') is 'allowed to sink into the subsoil,' which (at Aden) we are told is so useful as to 'absorb 'the contents.' The arrangement for enabling it to do this is shown in Fig. 1. Figs. 2 and 3 represent the usual construction of latrines. In Fig. 2 the contents are intended to be swept up and removed daily by hand,—a noisome and dangerous process, especially during epidemics. Fig. 3 shows the cess-pool system of 'cleansing,' which means saturating the subsoil with filth, and endangering all the wells in the neighbourhood.

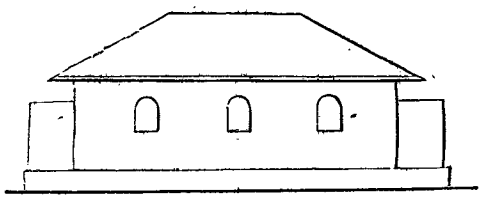
At Neemuch, which has attained the high pitch of civilisation of building latrines for its bazaar, the 'latrines are too close to the houses, and are not used 'at present, *for lack of a proper establishment to keep 'them clean.*' Therefore the people at Neemuch do

like their neighbours in this respect, a proceeding which it is impossible to describe farther. At Asseerghur a similar abomination appears to be practised on an 'open space of ground near the main 'guard and parade,' which is 'always offensive,' and 'ready to nurture epidemic disease.'

Fig. 2. LATRINE. POONA. Plan.



Elevation.



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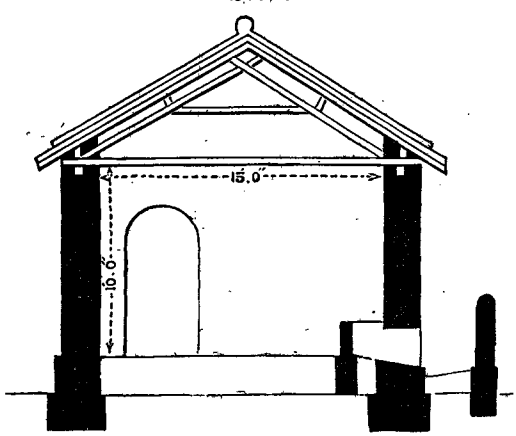
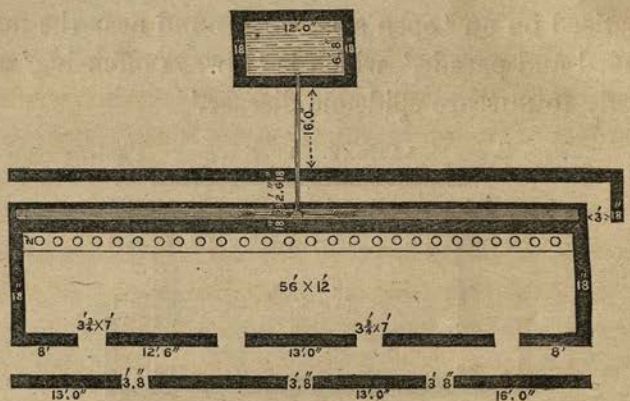


Fig. 3.

INFANTRY BARRACKS LATRINE. BELGAUM.

Plan.



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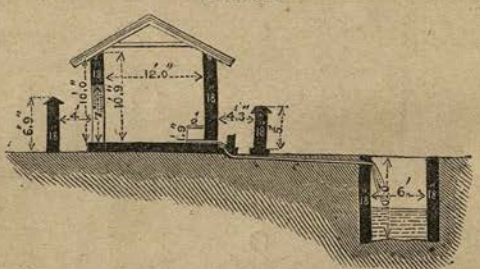


At Asseerghur the 'construction of sewers and 'drains has not as yet been considered.' They 'consider,' on the contrary, that the sewage 'will 'probably be removed by hand.' The refuse, in all cases, is thrown 'over the fort wall.' 'One of the 'tanks' is called 'unsavoury.'

Almost everywhere it is said, as at Nusseerabad, Kirkee and Poona, and Dinapore, all of them large and important stations, 'barracks and hospitals' are

'only wet' or 'damp' during the 'rainy months,' as if it were a proof of great and unusual precaution in construction which builds buildings to be dry in dry weather.

At Fort William it is stated that the fluid refuse is swept away by garrison sweepers and water carriers, with the *aid of a fire engine*; that much of it evaporates; that the outlet is a foul ditch.

Dinapore also boasts of a foul ditch, often very offensive. At Poonamallee the 'foul ditch' surrounds the fort and encloses the hospital; and 'all fluid 'refuse sinks into the subsoil where it falls.'

At Cawnpore is the singular statement, that the drains are 'not intended' for draining cookhouses, privies, &c. Here, as elsewhere, the drainage is

INDIAN DRAINAGE SYSTEM.

effected *by hand*; that is, everything that will not evaporate or sink into the ground is carried away to a distance in pails, skins, or carts, and emptied out.

At Meerut the cesspools are cleansed 'by opening 'the tops and drawing out the fluid in buckets.' It is said 'they seldom require cleansing.' We may infer from this what a condition of saturation the subsoil must be in!

Agra employs all the powers of nature, and none of its own, to get rid of its 'fluid refuse;' evaporation, sinking into subsoil, &c. Nature, however, is dilatory, which renders 'raised paths necessary between 'the barracks.' The water from the lavatories is collected in an open cesspool, from which it is *spread over the ground.* The hospital cesspits are deep wells, *never cleaned.* It is 'tried to keep them sweet 'by lime, *but in vain.*' (Probably.)

At Umballa the surface water 'disappears with 'tolerable rapidity.'

Meean Meer, the new station for Lahore, has no drains about the barracks. The water lies for hours. The lavatory cesspools sometimes overflow, saturate the ground, and taint the atmosphere.

These cesspools, as in Fig. 3, were intended for saturating the ground with foul matter, and out of the same ground the well water is taken.

Is not the whole history here of the late frightful cholera at Lahore?

And why cannot the refuse which does so much mischief by remaining be used to do good, and raise any amount of vegetables in soldiers' gardens?

Ferozepore tells the same story of no sewerage or drainage. Also at Ferozepore the lavatories *are* brick and mortar floors, 'adapted for receiving and 'draining off the water into the subsoil outside, so 'that the men may freely bathe themselves!' There is no bath except the aforesaid floor. So at Peshawur and Sealkote is the same want of all sewerage or drainage.

At Berhampore, with its square mile of cantonment, only one cart is allowed to remove the contents of the privies to 'holes a mile from barracks.' The vicinity abounds in jheels and foul ditches, with putrid water.

Allahabad, one of our largest and most important stations, in one of the worst positions, as if that position were not unhealthy enough by itself, trusts to nature again, has no drainage nor sewerage, and leaves its surface water to 'evaporate,' 'percolate,' and 'run off.'

Benares follows in the train. At Rangoon the drainage is supposed to run up-hill. For we are told that all sewerage and drainage are merely 'trenches made without reference to slope.'

Landour, which is a hill station, has every house damp for three months in the year. Yet their 'spacious lavatory, with brass basins,' is not much used, 'from the scanty supply of water in the dry 'season.'

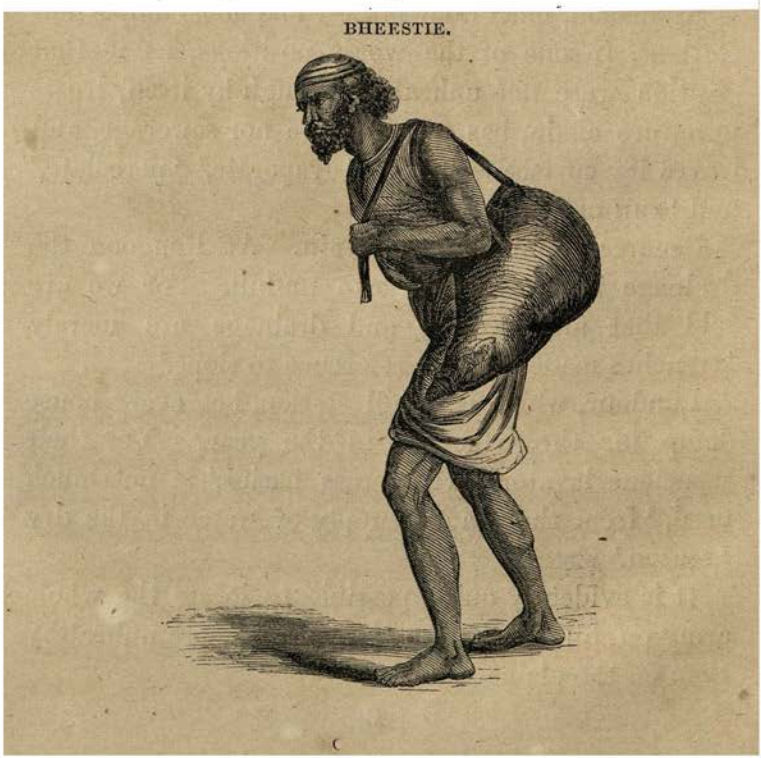
It is evidently quite possible to locate the whole army on hill stations and leave it more unhealthy than on the plains.

Nynee Täl, also a hill station, lets all its fluid refuse flow down to plains below.

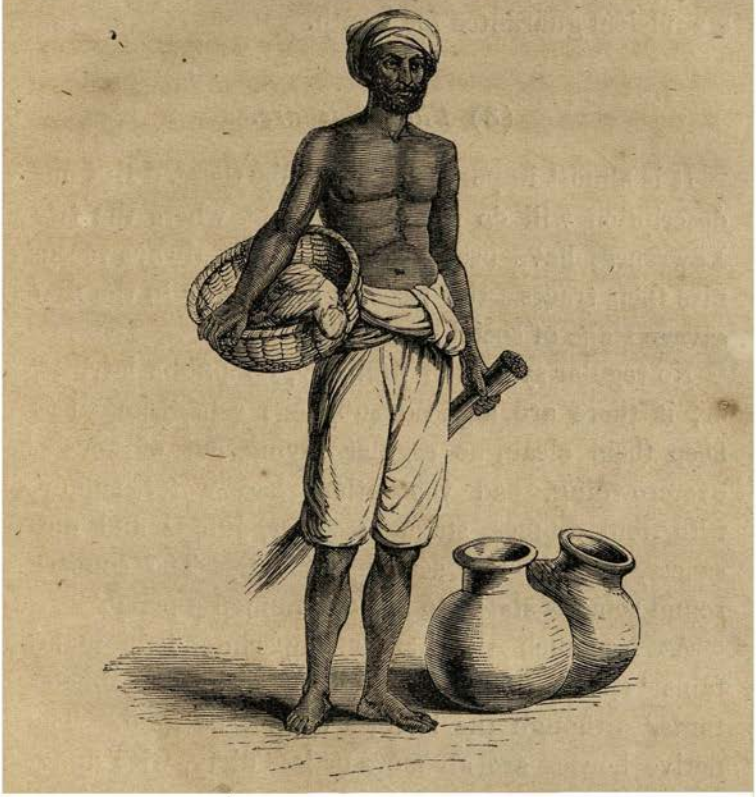
It is impossible to pursue this subject further. There are such much worse things in the Stational Reports than what I have chosen to give, that I must say to those who call my 'bonnet ugly,' 'There are 'much uglier bonnets to be had.'

The system of water supply and drainage in India may be briefly defined as follows; they draw water from a well, not knowing whence it comes, and if there be any means to drain off water it is into a

These two officials represent the system of water supply and drainage in India for garrisons and towns.



MEHTER.



cesspit, or into long, open, pervious drains, not knowing whither it goes. Where this is not done, all the fluid refuse is collected in open cesspits, and carried away by hand labour or carts. Or else it is allowed to dispose of itself in the air or earth as best it can.

Drainage, in the sense in which we have found it necessary for health in this colder climate, is by no means considered necessary for health in the hot climate of India; for, as in the case of the water

supply, most of the reporters consider *no drainage* a sufficient guarantee for health.

(3) *Filthy Bazaars.*

It is almost impossible to describe these. But one description will do for all. Except where the two Lawrences have been—there one can always recognise their traces—the bazaars are simply in the first savage stage of social savage life.

No regular system of drainage, no public latrines, or, if there are any, no sufficient establishment to keep them clean, no regular laying out of houses, overcrowding, bad ventilation, bad water supply, filth, foul ditches, stagnant water, jungle and nuisances, this is the account of all. The country round some is stated to be 'one immense privy.'

At Neemuch the Bazaar Superintendent maintains 'strict supervision,' and 'punishes the inhabitants,' although the latrines cannot be used. The native houses are all more or less dirty, with dung-heaps close to them. The 'disagreeable emanations' from the bazaar are felt in barracks.

In Dinapore some streets were impassable dung-hills 'last year,' 'until cleared.' The elephant sheds and all the south of the station in a state disgraceful to any cantonment. The drains, deep holes of festering mud. No latrines, although 'the population is as 'thick as can be;' until lately, only one filth cart, now three. At a neighbouring village the dead are buried within the huts.

At Agra it is a proof of 'respectability' to have cesspools. The inhabitants (152,000) generally 'resort to the fields.'

English works, treating of sanitary improvement, insert sections of the bad drainage arrangements. But none contain such an illustration as this of how a woman is made to supply the place of a drain tile.

FEMALE SWEEPER.

At Berhampore 'no-'thing can be worse than 'the sanitary condition 'of bazaars.' The native houses are dirty in the extreme. Dung-heaps or deep holes full of stagnant water, the common cesspit of the houses, are close to them. The nuisance is felt even at barracks. The 'Con-'servancy' establishment is quite unequal to its work.

At Muttra the bazaar is an accumulation of huts without order. 'Drainage bad; ventilation worse; 'water supply execrable.' 'All the wells brackish, 'from nitre,' the earth being contaminated with all sorts of impurities. 'Latrines 'hardly known.' 'In 'short, the bazaar is a mass of filth.'

At one hill station, Nynee Täl, where *men are sent for their health (!), the stench is at times overpowering*, from both bazaars being in a filthy and crówded state, no proper drainage or latrines, no means of preserving cleanliness, which causes nuisance, even in the barracks. At another, Darjeeling, among other defects, the native villages, writes the medical officer, 'are the most filthy' he has 'ever entered, 'and it is quite sickening to walk through them.'

At Jubbulpore, where every hut is crowded, where there are no latrines, where cleanliness is almost impossible, the same causes produce the same results.

At Cannanore the native houses have dungheaps and cesspits within the compounds. Owing to the want of latrines, the 'filth and indecency' are described to be what it is impossible to repeat. The dead are buried within the compounds of houses.

At Trichinopoly the water supply is bad, scanty, and brackish. The bazaar is said to be 'clean,' while the open cesspits are described as an 'intolerable nuisance' when the wind blows over them. The native houses are ruinous and not ventilated. Levelling, filling up, pulling down deserted huts, &c., is urgently required, but not done.

Those who think I have given anecdotes and not fair illustrations, I refer again to the Stational Reports for further and fouler evidence.

These instances are enough to illustrate the subject. Bazaars are the real hotbeds of disease, and require sweeping reforms as much as or even more than the stations.

Native regimental bazaars, from which the soldiers procure supplies, are within military limits, and as much under military control as the ground on which the barracks stand, and *ought* to be kept in as good a sanitary state as the barracks will be when thoroughly improved.

(4) *Want of Ventilation.*

The reports generally say, ventilation good, if barracks not overcrowded. But as the barracks are almost always overcrowded, we must conclude ventilation is bad.

Or they say, ventilation sufficient, because doors are kept open during day, which is as much as to say, ventilation is sufficient because it is not.

At Kirkee there can scarcely be said to be *any* ventilation in barracks. There are pigeon holes in the roof, but during the rains, when ventilation is most wanted, these have to be covered with tarpauling. At Poona the weather side has to be 'dammed up' during the monsoon. At Bombay it is said that ventilation is generally sufficient; 'at least there are no complaints,' although 'improvement is 'imperative.'

At Kamptee the ventilation is described as 'most 'faulty and deficient,' although there are three openings in the roof of each barrack. The windows are unglazed. At Ramandroog, a hill station, the doors are venetianed in the upper half, 'a great dis-'advantage in wet weather.' Half glass doors are required. At Bellary there are no windows. The

doors are half venetian, half panel. At Trichinopoly, one of the very hot stations, the old artillery barrack is stifled by having only doors.

At Dinapore, where the ventilation is entirely by doors and skylights, 'which latter, however, do not 'open,' one may safely say, ventilation not sufficient when doors are shut (at night). In the 'permanent 'Hospital' at Dinapore, placed so that the 'wind 'does not blow across' it, the ventilation is only 'sufficient' when the doors are open.

At Allahabad the doors have to be closed in high winds, dust storms, &c.; and the ventilation, although there are roof ventilators and small windows over the doors, is generally insufficient. The hospitals of Allahabad, although they 'face the wind,' have 'in most instances no windows, except openings over the doors, and in the roof.' And the ventilation is pronounced to be 'very defective,' especially when the doors have to be closed.

So at Dumdum.

At Agra ventilation is said to be sufficient, provided the verandahs are not occupied for sleeping.

But the verandahs are occupied for sleeping.

At Landour, where sick men are sent to get well, there is both overcrowding and bad ventilation. There is no roof ventilation.

At Nynee Täl the air is said to be 'pure' inside the huts, which means that they are always full of 'smoke.'

The cooling by tatties, i.e. air passing through damp vegetable matter, often tends to produce ague.

External ventilation is often also bad, as at Dinapore, Allahabad, and Berhampore, not giving the barracks the benefit of the prevailing winds. This is a point of primary importance in India. At Muttra, although there is abundant ridge ventilation, the entire length, it is insufficient at night, simply because the barrack is in a position which the wind cannot reach.

At Allahabad one-third of the station is below the level of the river.

Generally, very little attention appears to have been paid to independent ventilation as a cardinal point of barrack construction. Doors and windows have been trusted to; yet they are so placed that men are often exposed in bed to hurtful draughts, and if shut, the fresh air is also shut out. Sometimes there is no glass in the windows, and when these are shut there is darkness as well as foul air.

A knowledge of the proper application of sanitary appliances to building in India appears to be as yet in its infancy.

(5) *Surface Overcrowding.*

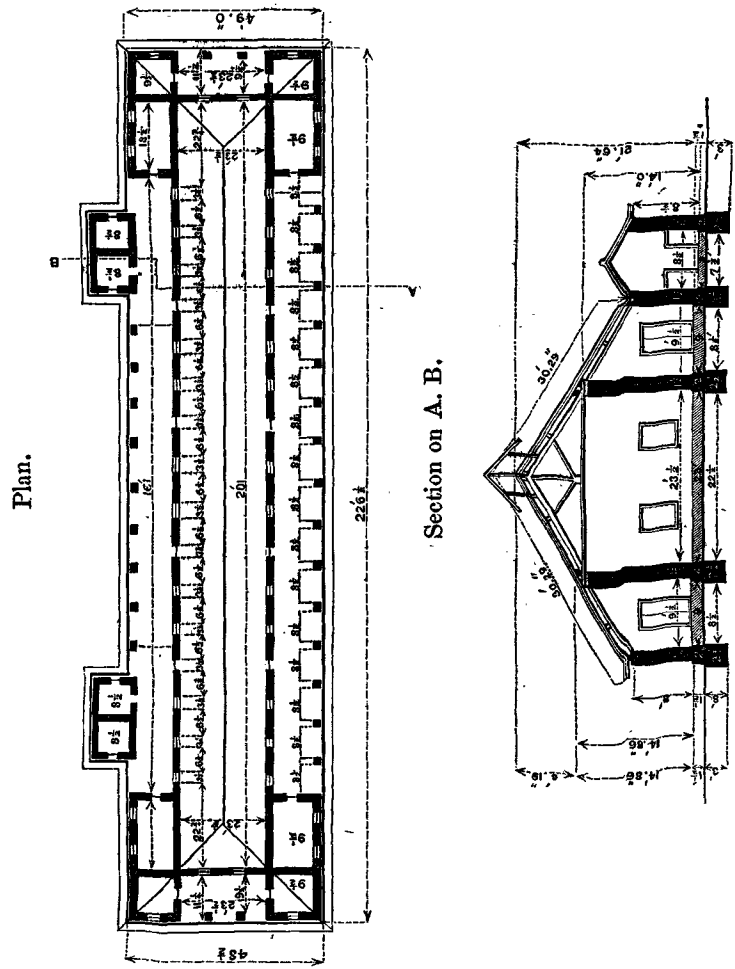
The structure of Indian barracks varies much. But in one thing they almost all agree, viz. in crowding the men upon the floor.

Fig. 4 represents a plan and section of a hut room at Deesa, no less than 200 feet long, intended for 80 men, at 1,116 cubic feet per man. It is well constructed for ventilation, and is altogether one of the

best plans in India. But for its 80 men, which is just four times too many for any room, it allows less than 59 square feet per man.

Fig. 4.

EUROPEAN BARRACK. DEESA.



Even in the most recent barrack plans there is the same defect.

Fig. 5 gives a plan, elevation, and section of the new barrack, either erected or about to be erected, at Mhow. The elevation shows a magnificent and costly structure. But it is on two floors; it has double verandahs, the inner ones occupied by beds, so that there are four rows of beds, and 53 feet between the opposite windows; the ventilation of the whole interior is interrupted in rather an ingenious way by cross walls, and the men have 65 square feet of space each.

But even this is not the worst.

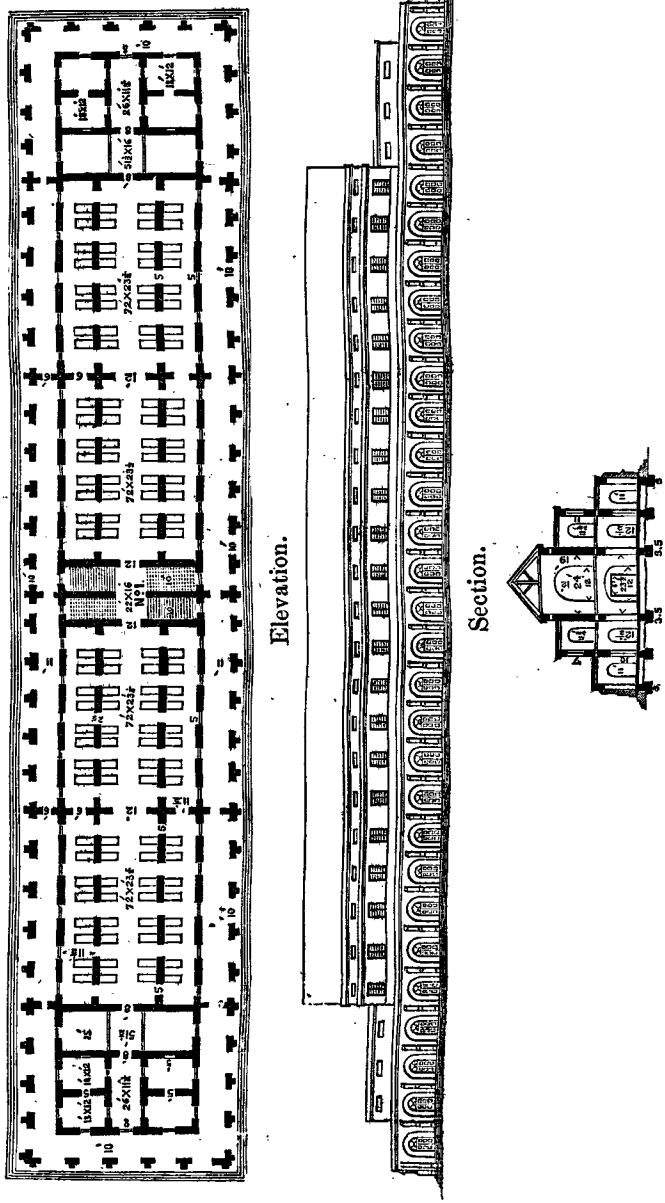
At Fort William, the Dalhousie barracks, which are said to be 'perfect,' have *six* rows of beds between the opposite windows, 216 beds by regulation in each room, and three floors of such rooms. While it is added, '900 men' (300 men per room) 'are generally 'accommodated in the barrack without inconvenient 'overcrowding.' What is *convenient* 'overcrowding?'

The cubic space generally looks large in India, but the height of the rooms being enormous, often greater than their width, the superficial area is comparatively small. At Cawnpore the barrack rooms are from 25 to 30 feet high. The superficial area for 1,000 men in 10 rooms is only 41 square feet per man, for 140 men in two rooms 61 square feet per man, and for 240 men in two rooms 88 square feet.

Also, the cubic space presupposes the inner verandahs not to be occupied. But in some places, as at Cawnpore, they are invariably occupied from

Fig. 5

INFANTRY BARRACK. MHOW.



influx of troops beyond the accommodation; there are then four rows of beds between opposite windows.

In all the five barracks of Fort William the men put their cots in the verandahs in hot weather. Perhaps the wisest thing they can do.

At Dinapore again are two of these enormous barrack-rooms (827 feet long, for 308 men). The superficial area in these rooms is 94 square feet per man. But one may safely say that 120 would be barely enough under such circumstances. Madras has two stories, of one room each, for 1,030 men, the upper of which rooms is stated in the return as nearly 2,125 feet long (probably the longest room in the world), for more than 600 men; and the other 1,483 feet long. The superficial area per man is only between 60 and 70 feet in these overgrown monsters of barrack rooms. Secunderabad has 10 rooms, for 104 men each, with only from 40 to 60 square feet per man. At Poonamallee there are two long rooms, with 300 men in each, of which the space given by the dimensions is so incredibly small (112 cubic feet and $8\frac{1}{2}$ square feet per man), that it is scarcely possible to believe them given correctly. The verandah, it is said, is frequently used as sleeping quarters. (No wonder!)

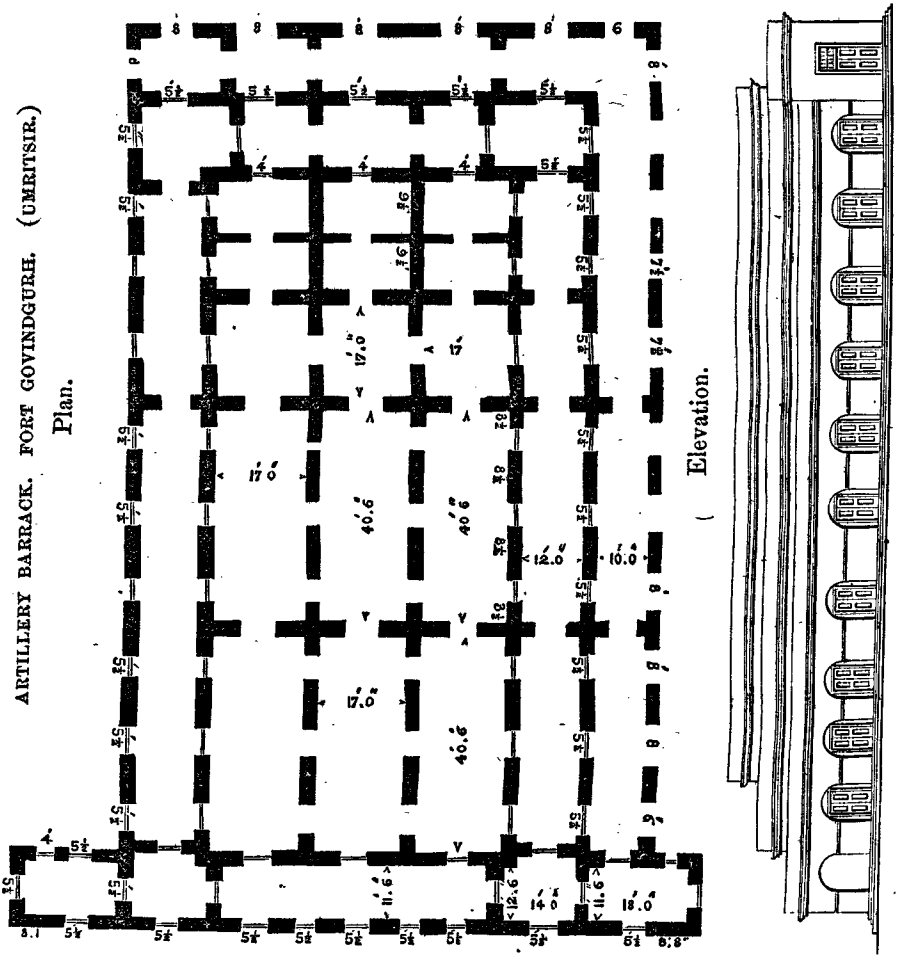
At Meerut, for upwards of 4,000 men, the superficial area is only from 52 to 79 square feet per man, and the verandahs are occasionally used for sleeping on sudden influx of troops.

At Agra it is the same. So at Jullundur.

There is one barrack at Fort Govindghur, at

Umritsir, in the Punjab, a plan and elevation of which are given at Fig. 6, which is a perfect nest of rooms one within the other, and has an open verandah besides. The elevation looks promising enough; but the inside, with its double defences of windows

Fig. 6.



and doors against the outer air, is about the last place to put 70 men in. The distance between the opposite windows is 86 feet. The superficial area in this case (better than in the other instances, but more than counterbalanced by the extraordinary construction) appears to be about 85 square feet per man.

The men are far too crowded in their Indian barracks. In almost every case there are too many men in the rooms for health.

The floors in most barracks are merely the ground bricked over, or they are of stone or of a kind of plaster.

At some stations the floors are of earth, varnished over periodically with *cow dung*! a practice borrowed from the natives. Like Mahomet and the mountain, if men won't go to the dunghill, the dunghill, it appears, comes to them.

To sum up: it is not economical for Government to make the soldiers as uncivilised as possible. Nature sends in her bill—a bill which always has to be paid—and at a pretty high rate of interest too.

III. Intemperance.

There is a good deal of intemperance among soldiers everywhere, but I very much doubt whether the same amount of tippling ever goes on in the British army in this country as appears to be encouraged by the canteen system in India.

A soldier in India may buy at the canteen no less

than a gallon of spirits in 20 days, or he may have a quart of strong beer every day *and* one or two drams of rum or arrack.

It is easy to see what must be the effect of this on health in such a climate.

The gist of the stational returns amounts to this:—

Men all 'temperate.' The maximum allowance daily per man is three quarts porter, or two drams spirits *and* one quart porter, or one dram spirits and two quarts porter. This as at Mhow, the largest of our stations in the Bombay Presidency. Agra too issues to each man per diem, during the 'cold season,' two drams of rum *and* one quart of beer. But 'no 'more than' two drams spirits, or 'one quart (32 'ozs.) porter and one dram (3 ozs.) spirits' per man per diem is the common allowance.

Sale of spirits 'strictly forbidden' in bazaar to soldiers; every man can nevertheless get as much as he likes in bazaar, *besides* the above quantity. For, as might be expected, it is practically impossible to encourage and restrict an evil at the same time. Government sells the licence to sell drink in the bazaar, and orders the men not to profit by it. The present law is like lighting a fire and charging it not to burn anything.

'No confirmed drunkards;' cases admitted into hospital directly from intemperance, numerous; *indirectly*, innumerable.

Average of habitual drunkards in some European regiments not less than 15 per cent.

At Fort William seven trials for habitual drunkenness in 8th Regiment in three months; in the 5th Fusiliers admissions into hospital *indirectly* from intemperance, 17 in 100; *directly*, 2 in 100. Spirits, it is said by more than one report, are the curse of the European soldier in India; also, that the evil effect of spirit drinking was manifest during the last field service. In seven regiments in Madras in 1849 the percentage among different classes was (roughly) as follows:—

	Punished	Admitted	Died
Teetotallers	23½	131	1·1
Temperate	58½	141½	2·3
Intemperate	171	215	4·5

Again, it is said (Hazareebaugh), 'soldiers as a body temperate,' *and*

One-third of disease, and
One-half of crime,

produced directly or indirectly by drink.

The long-cherished idea as to the necessity of spirits for the British soldier is, it is stated, thoroughly exploded. A man who drinks tea or coffee will do more work than a dram drinker, though considered sober. And why? Because now we know that tea and coffee prevent waste of the system under exertion; while spirits afford no more than temporary stimulus followed by exhaustion or collapse, both of which conditions are powerful predisposing causes of disease, especially in an exhausting climate. It is an error to sell spirits in canteens to prevent

men obtaining worse spirits in bazaars. It creates craving, to be satisfied elsewhere. Again and again it is said that selling rum in canteens is an unmitigated curse to a regiment, destructive alike to health and discipline; that it will be a 'happy day' when nothing but beer, light wines, coffee, tea, lemonade, &c. are to be sold. Col. Greathed, than whom we have no better authority, says that he 'should wish 'beyond everything to see the practice of supplying 'spirits in canteens abolished.'

In one year (1859), at Allahabad, there were 36 cases of delirium tremens, of which 5 were fatal.

At Umritsir one-sixth of the admissions are directly, and one-half indirectly, from drink. Its effect is 'injurious to the last degree.'

At Chunar, though the men are 'mostly tempe-'rate,' yet, on a 10 years' average, *one man in three* (!) of the admissions was admitted into hospital directly from drink, besides those indirectly. The deaths were just twice, the crimes just 10 times as many among the intemperate as among the temperate.

It is a comfort to hear that at Secunderabad the 'average number of confirmed drunkards varies.' But 25 out of 26 cases admitted into hospital indirectly from drink (Secunderabad's statement) is really too bad. Though when it is added, that in this large station, occupied by nearly 3,000 men, there is so little for them to do that they 'go out in 'search of liquor,' it is the less surprising. And the immense amount of epidemic dysentery that sweeps

over the place occasionally, under such a system, is still less surprising.

At Bangalore, one of the largest of our Madras stations, where numerous acute attacks of disease are brought on by the quantity of spirits drunk, notwithstanding its fine, healthy, temperate climate, 3,000 feet above the sea, it is stated that, probably, 'not three men out of five go to bed perfectly sober,' and when pay is issued not two in five. That, of one-year soldiers, 1 per cent. is a drunkard; after two years 2 per cent.; and so the proportion increases with length of residence, owing to their 'idle, listless, objectless lives.' In India, temperance is the exception and intemperance the rule. 'But 'Government is to blame.' It 'bids them drink 'freely,' and when the habit is confirmed 'denounces 'them as a disgrace to their country.' 'The 'habitual daily two drams ruin the health and 'habits of the soldier, who thinks that as long as 'he takes only what Government allows him, he 'cannot go wrong.' The taste for spirits, it is said is 'not easily acquired by young soldiers.' 'The 'habit of spirits is maintained by their authorised 'use.'

The temperate men, it is stated, all drink occasionally; impossible to say how much spirit is sold in the bazaars. At present the collectors encourage the sale as much as they can for the sake of the revenue. Under no circumstances, except extraordinary fatigue, almost all agree, should any drink but beer, tea, or coffee be allowed, and the loss of

revenue should be otherwise compensated for. Acquiring a taste for spirits should be discouraged in men by every means. It should be absolutely interdicted on the passage out, and malt liquor given instead, with good food, good water, and good accommodation. For want of these, about 10 per cent. of the recruits arriving from England at Kurrachee have in certain years suffered from scurvy.

'All spirit drinking is injurious to health.' 'Nine-'tenths of all the crime is caused by it.' 'It is 'directly or indirectly the root of all evil in the 'army.' Such is the testimony borne in these reports.

In Burmah, when malt liquor could be had, health always improved. A marked change for the worse took place when spirit was issued instead.

Where beer was introduced, the 'tremulous, 'yellow-skinned, emaciated' spirit drinker was rarely met with.

Madras Presidency says that 'health, efficiency, 'and discipline would be materially improved by tea 'and coffee in preference to spirits and malt liquor,' 'as has been proved when neither spirits nor malt 'liquor could be had.'

Barrackpore says that, if spirits were abolished and dietary improved, the mortality among our men would be 'extraordinarily diminished.'

Fatal cases (in sickness) mostly occur among intemperate men.

There is hardly a difference of opinion as to the

necessity of abolishing the use of spirits in the Indian army. Men would be blind, indeed, to the most glaring facts who would justify its continuance. The only plea on the other side in the reports is a very old one, which has been used to justify other vices besides dram drinking, viz. that, if we do not give spirits in the canteen, which we all believe to be bad for health and discipline, the men will get worse spirits in the bazaar. Thus the men are killed by liver disease on canteen spirits to save them from being killed by liver disease on bazaar spirits, Government in either case benefiting pecuniarily, as is supposed, by the transaction. May there not be some middle course whereby the men may be killed by neither bazaar nor canteen spirits?

IV. Diet. *Excess of Food.*

It appears extraordinary to give the soldier the same amount and quality of diet in all seasons, in tropical as in temperate climates. And yet every day the soldier has 1 lb. animal food, 1 lb. bread, 1 lb. vegetables, 4 oz. rice, tea or coffee, and sugar, besides his spirits and beer, and any amount of extra animal food he may buy for breakfast and tea. Of all countries India is the one where men cannot be dieted the whole year round by the same rule without mischief. But only a few enlightened men appear to have any idea of what effect this extraordinary system of dietetics has on the soldier's health.

Surely we have sufficient knowledge of dietetics to be able now-a-days to vary our diet to suit climates and seasons, and to know that we cannot eat everything everywhere. Sir John Lawrence says in his evidence that Government 'might try to induce the 'men, by varying the ration with reference to hot or 'cold weather, to take more to vegetable diet.'

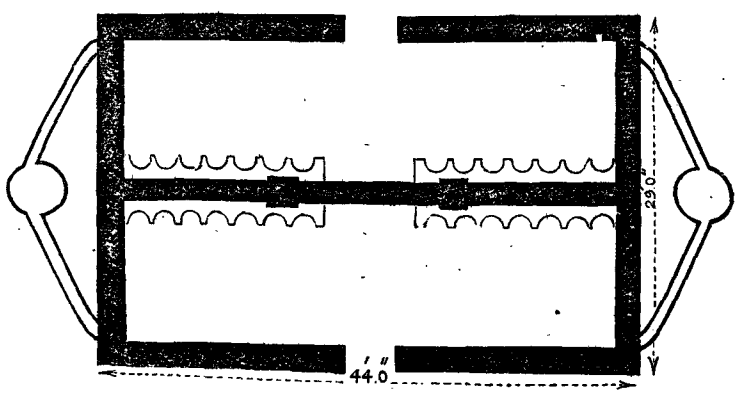
The means of cooking are of the rudest order — a small square outhouse, sometimes without a chimney, often far from clean, is the regimental kitchen. As for boilers and ovens, considered indispensable at home, there are none. A few holes to put the fire in, and moveable utensils to hold over them, are all that India thinks it wants. There is of course no water laid on, and no drainage. Here as elsewhere is the inevitable cesspit, and sometimes there are two.

Fig. 7 is a plan of a double kitchen at Hazaree-

Fig. 7.

COOK-HOUSE. HAZAREEBAUGH.

Plan.

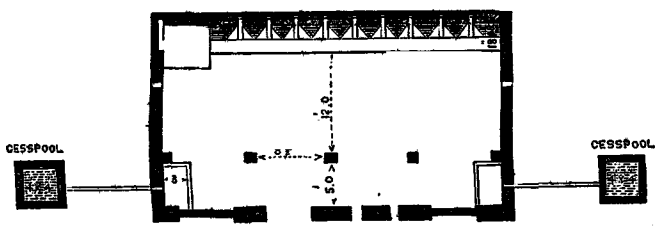


baugh. Fig. 8 is a by no means bad example at Belgaum. Both show the total want of civilised appliances. And although the cooking is not often complained of by the stations, there is very good authority for stating that the food is imperfectly cooked, or served up in a way which destroys the digestive organs, and leads to the use of stimulants to promote digestion.

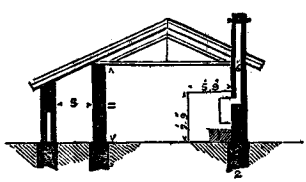
Fig. 8.

ARTILLERY COOK-HOUSE. BELGAUM.

Plan.

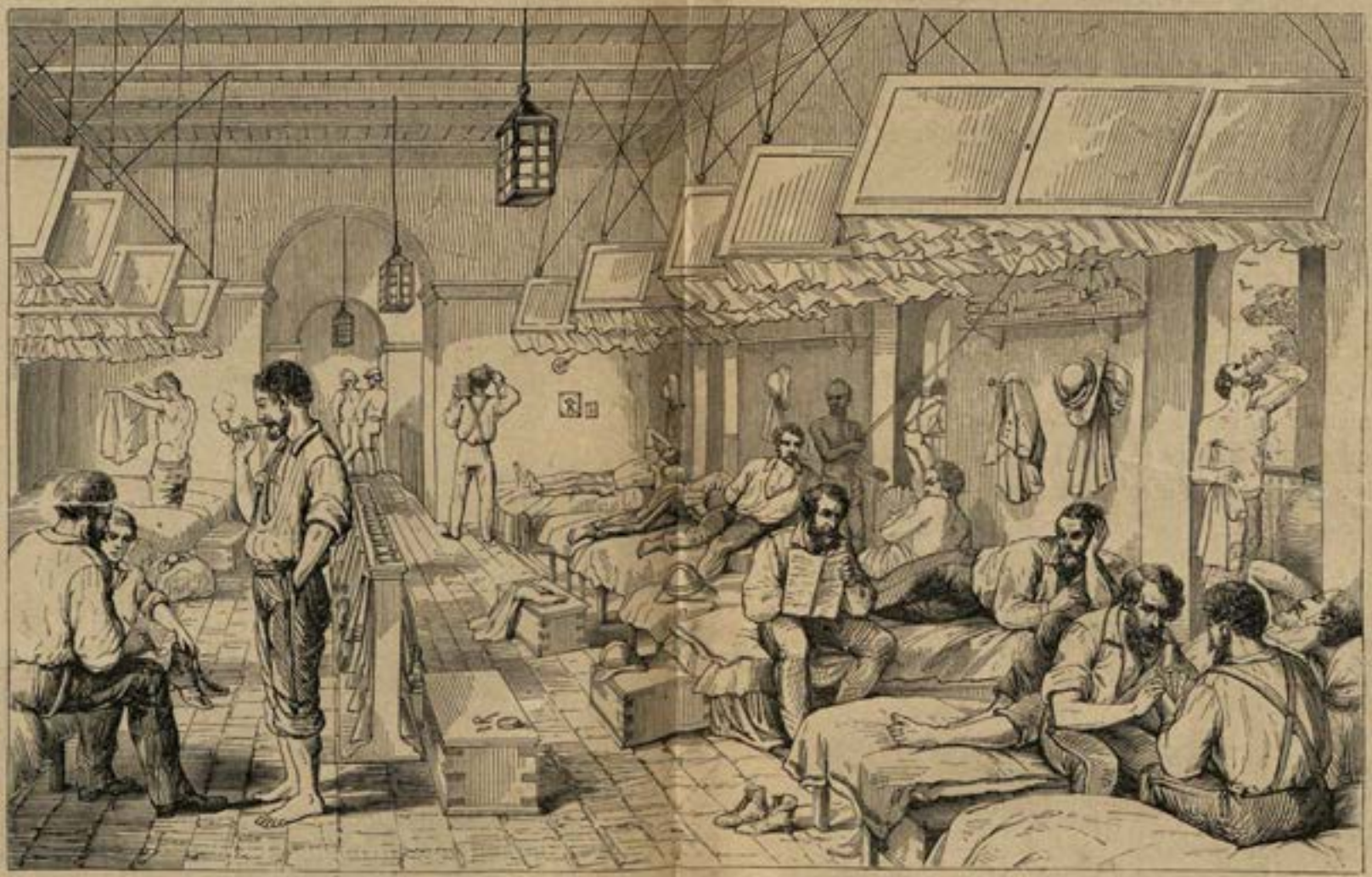


Elevation.



V. Want of Occupation and Exercise.

To understand the influence of this system of dieting and drinking, it must be remembered that, except morning and evening parades, and the man's turn on duty, he has nothing in the world to do. He can neither amuse himself, take exercise, nor turn his time to profit for himself, for there are no



DAILY MEANS OF OCCUPATION AND AMUSEMENT. INDIA *passim*.

means of doing any of these things. All the spare time people usually give to active occupations he spends lounging in his hot barrack room, most of it on his bed.

The accompanying graphic woodcut of the manner in which a soldier spends his day is from a drawing kindly sent me by an Indian officer of rank. (See pages 40 and 41.)

India actually reverses the ordinary human day, for the men spend 18 hours of the 24 in or on their beds, and six hours only up or out. Indeed, Kamptee says that 'for many months of the year 'the men are confined to barracks for 20 out of 24 'hours.' And your imagination must fancy 100 to 600 men or more packed into the same room for eating and sleeping away these 20 hours.

This is an account of a soldier's day:—

bed till daybreak;
drill for an hour;
breakfast, served to him by native servants;
bed;
dinner, served to him by native servants;
bed;
tea, served to him by native servants;
drink;
bed;—and *da capo*.

So that the Briton exactly spends his spare time between eating, drinking, lounging, or sleeping; and he eats meat always twice and sometimes three times a day.

All his meals are condensed into the hot hours of the day. And just when he wants one most, viz. *before* he goes out to his early morning work, he does not get it. Why not give him hot coffee before morning parade, and beer, if he must have it, at dinner and at night? Not one report except Tonghoo but prays for the abolition of all this dram drinking; and it is said that the *abstinent* man is more enduring of fatigue and less obnoxious to disease than even the *temperate* man. Spirits, it is said, should never be offered for sale, as men are induced to take spirits who never would if they were not so 'handy.' Trichinopoly says that the sale of spirits should be abolished in canteens, bazaars, and within a circle of 10 miles round barracks.

If the men had employment, recreation, good tea, coffee, milk, more variety of food and of cooking, spirit drinking might be abolished. A good hot cup of coffee is the best stimulant for a soldier. As it is, the old soldiers often take a dram before morning parade, and nobody can prevent them.

The following piece of information is curious (the scene lies in the Madras Presidency), viz. that 'the canteen funds' (the profits derived out of the soldiers' drunkenness) 'are insufficient to 'provide amusements to keep the men from drink-'ing.' Also that where there is no library there are 'plenty of books which can be read till 8 p.m., 'when all lights are put out.' Berhampore has a library and reading-room, but 'neither lighted at 'night.'

That want of occupation, leading to drink, lays the seeds of disease among the troops, is acknowledged. 'Alcohol and unrefreshing day sleep,' says Bangalore, 'contribute to engender disease and 'accelerate mental and physical decay.' Ahmednuggur says that, for one man occupied in a barrack, there are six idle. Also, that when men are actively engaged in the field in hot weather, there is little sickness or epidemic disease among them. So unaccustomed is the soldier to ordinary exertion that, as might be expected, the short parades are talked of as injurious, as if they were long harassing marches; while, curiously enough, it is admitted that the soldier is never better than when he is exposed to the harass and fatigue of field service.

Kolapore and Belgaum say that, the more varied and agreeable a soldier's occupations, the better his health; that the troops require means of occupation and amusement to keep them out of the bazaars.

All the sensible reporters say that too much stress cannot be laid on the importance of using the utmost exertion to provide legitimate amusement and occupation for the men—workshops, shelter for athletic games, &c. We must always remember that, in hot weather, the men, save those who can read, 'have 'positively nothing to do.' Employment on public works 'would be a great boon;' 'the work would be 'as cheaply done as now; it would occupy the soldier, and he would feel he was doing good.' Savings banks would answer, 'if workshops for 'trades were established.' The usual account from a

station is, no library, nor reading nor day room, no club, no garden, no workshops, no theatre, no gymnasiå, no means of instruction or recreation whatever, no skittle grounds, or if there are any, not covered, no sufficient shade for exercise. And the men are generally confined to barracks from 8 A.M. to 5 P.M. in hot weather.

Cawnpore actually orders the men to be confined to barracks for 10½ hours a day in hot weather; but the order 'is often disobeyed.' At Chunar there is no restriction as to exposure to the sun. The 'men 'go about at all times, and, except when under the 'influence of liquor, do not appear to suffer from 'exposure.' Yet Chunar's mean temperature is 65° in December and 92° in June, its sun temperature as high as 120° in June. And yet the men do not 'suffer from exposure.'

Agra, Ferozepore, and Umballa say that a large covered building for gymnastics, workshops, games, with a library, reading, and coffee room, a theatre and plunge baths, 'would draw many men from their 'cots, where they idle and sleep all day.' And Peshawur recommends that this building should be separate from barracks.

Dinapore recommends a farm-yard to employ the men: an excellent idea.

Meean Meer (Lahore) suggests photography, modelling, and drawing as occupations for the men.

'Sealkote (1,200 men) and Ghazeepore (850 men) may be offered as examples of the two opposite types of rational occupation and idleness.

Sealkote, indeed, is the only station, except Rangoon, which has anything like completeness. It has ball courts and skittle grounds. It has schools and regimental libraries. It has a well-lighted reading room, with chess, backgammon, dominoes, and 16 newspapers, &c. It has a soldiers' garden, with seeds and tools provided by Government, who grant prizes for the best cultivation (*soldiers'* gardens, when they exist at all, are elsewhere worked by *natives*). It has armourers', saddlers', tailors,' shoemakers', and one watchmaker's shops. It has theatres; it has cricket and regimental clubs; it has foot-ball, and it is particularly fond of quoits. The savings bank of one of its regiments has 8,000*l.* It has sufficient shade for exercise. Yet Sealkote does not think it has done enough. And while other stations, whose men 'lie in their cots all day,' seem unaware that anything else is desirable, Sealkote wishes that 'workshops for every trade' were instituted, as they might be, and 'strongly recommends' a gymnasium.

It is noteworthy that the health of the troops at Sealkote seems to require but little amendment, and that no complaint is made of its climate.

Rangoon has a ball court and skittle grounds; schools, three libraries and day rooms; soldiers' gardens; shops for trades; two theatres. But Rangoon says it requires lofty open sheds for gymnasia; and that Government should afford every aid in establishing good coffee rooms, *independent of canteens*,—all amusements to be as near as possible, all

canteens to be as far as possible, from the coffee rooms.

Now take Ghazeepore. Its whole means of occupation, instruction, and recreation, are one ball court and two skittle grounds. Its whole shade consists of the verandahs, under water during the rains. 'Almost everything has yet to be done.'

The large station of Allahabad (with accommodation for upwards of 4,000 men) is almost as ill-off. Tonghoo, the only station which considers the quantity of spirits drawn as 'conducive to health,' and the amount of 'sickness, mortality, and crime occasioned 'by intemperance' as 'trifling,' has, as might be expected from this statement, absolutely no means of occupation and amusement for its men, and few of instruction. It appears to consider drinking, idleness, and illness the normal state of things. At Bangalore (1,700 men) 'day rooms, soldiers' clubs, workshops, 'theatre, gymnasia and gardens, are things unheard 'of.' The 'regimental library has no attractions for 'men who read with difficulty.' This is the place where, as soon as 'the noonday gun announces that 'the canteen is open, a rush is made for the raw 'spirit dram;' — where 'the canteen and the cot 'divide the hours unoccupied by the daily routine of 'petty duties.' What else can be expected? There is of course plenty of liver complaint here.

But amusements are not all that is required. In conformity with all reason and experience, Sir Charles Trevelyan observes that, however necessary and useful chess and backgammon, ball courts, and

skittle grounds, and even books and newspapers may be, they only furnish some present diversion, and do not supply any strong pervading motive, such as induces men to submit to sacrifices, and to make persistent exertions in other lines of life. This motive is to be found only in the hope of rising to a higher and better position. He advocates a system by which every soldier who conducts himself well and cultivates himself so as to acquire a knowledge of the native languages and other necessary attainments, should be able to look forward to promotion as a matter of course, either in the army or in the commissariat, ordnance, or other military departments, or in the department of public works or police. The British soldier in India would then feel himself engaged in the serious business of life, at least as much as any of his countrymen of the same class at home. The army would take its tone from the active influential portion of the men. The amusements of various kinds provided for the soldiers would be more appreciated and would have a more wholesome effect, because they would take their proper place in subordination to higher interests.

This is no theory. It was actually carried out by Sir C. Trevelyan at Madras. Men were first selected by competitive examination within the regiment. There was a second examination at Madras, and the result was the obtaining 'of 20 men who 'were the pick of the whole army for the administra- 'tive service of the Government in the civil and 'military departments.'

One element essential to placing soldiers in positions of civil usefulness is, of course, their learning the language of the country, necessarily part of that voluntary education which they must have for competitive examination. Learning the native languages in regimental schools would at once provide the men with interesting occupation and the prospect of future advantage. The War Office has already sent to all European regiments in the Madras Presidency a cheap edition of the New Testament and Psalms with a Clavis in Hindostanee, in furtherance of this object.

Sir C. Trevelyan would also encourage trades and handicrafts to the full extent consistent with the means of profitably disposing of the produce. And this is the more necessary, because all are not equal to the intellectual acquirements to which the previous remarks refer.

All officers who give an opinion on the subject concur in recommending workshops.

Dumdum, in the total absence of all means for occupying the men, opens a small museum, with lectures, to which the men crowd, showing 'that 'soldiers are ready to avail themselves of any means 'of rational amusement in the evening in preference 'to spending all their time in the canteen.'

Muttra, again, has no means of instruction, occupation, or amusement whatever, except a soldiers' garden, for which there are no tools, although indented for a year ago. Carpentry, saddlery, and coopers' work are in great demand, and would benefit the men, as regards health, morals, and finance.

Lucknow is building everything that is required, except workshops.

Rawul Pindee has nothing but schools.

Barrackpore petitions for fives courts, a theatre, gymnasia, swimming baths, public reading of good biographies, travels, and novels; for trades, such as clothing, accoutrements, barrack furniture, watch making, printing, paper making, baking. It says that savings banks should be connected with workshops.

Darjeeling has a hospital, reading-room, and reader: a very good plan. But for its men out of hospital, at a hill station, where the rain falls incessantly for five months, there are no means under cover provided, and the men are pent up in barrack-rooms, to the great injury of their health. Darjeeling says, 'there should be restaurants where men could get 'coffee, tea, newspapers, magazines, *and mix with* '*men of other regiments*, instead of the discomfort 'of the everlasting barrack-room.'

Hazareebaugh has a Government library, *not* lighted at night, a temperance reading-room, well lighted, with upwards of 200 members (out of 1,080 men, for which number the station has accommodation), and, although it has armourers', shoemakers', and tailors' shops, it strongly recommends further means of occupation and amusement, 'as the long days of the 'Indian hot weather hang heavily on the soldiers' 'hands.'

This part of the subject is by no means exhausted, but these examples and illustrations are quite suffi-

cient to show the small amount, indeed, of physiological knowledge which has been practically applied to the British army in India.

Suppose any one wanted to try the effect of full diet, tippling, and want of exercise, in a hot climate, on the health of men in the prime of life, the Indian army method would be the process to adopt, in the certain expectation that every man exposed to it will be damaged in health.

While all this scientific 'turkey stuffing' is practised, the men are carefully kept in barracks, and not allowed to exercise themselves. And everybody seems to believe that the way of making diseased livers in geese for Strasburg pies is the best way of keeping men's livers sound, and of making efficient healthy soldiers for India. Wherever the regimen is otherwise, as in the case of cavalry and artillery, who have some exercise, or where an enlightened officer allows his men to go shooting, there is, of course, improved health. But nobody learns the lesson.

People seem to consider that health is a natural production of India, instead of being the result of rational management. At the same time everybody says that India is 'so unhealthy.' Under this system of diet, regimen, drink, and idleness, it is indeed to be expected that cases sent to the hospital will be much more numerous, much more severe, and much less amenable to treatment and management than under a sensible system.

VI. Hospitals.

The Indian hospitals, though planned on simple principles, admitting of admirable details, are, as a rule, exceedingly bad as regards points considered essential to health and administration, even in this country. What would be, e.g., thought in this country of a hospital without a water-closet, or bath, or means of personal cleanliness? Such a hospital would be considered as a mere makeshift, till accommodation fitter for recovery could be provided.

The 'means of ablution' in Indian hospitals are often a 'tin pot, with which the sick pour the water 'over themselves.' Or, as at Bombay, they 'take 'water to bathe themselves from a trough.' Elsewhere, they have 'one tub, one basin to 100 men.' The means of washing, as at Ramandroog, a convalescent station, are 'two shallow earthenware pie 'dishes,' 'on a form in a room' ('very chilly in damp' weather) 'adjoining where the night stools are.'

At Rangoon the 'bathing accommodation' is 'hitherto nothing but a tub of water, without basin, 'soap, or towel.'

There may be a bath room. But 'all apparatus is 'entirely wanting.' The sick 'can always, if they 'please, get a skinful of water thrown over them by 'the water carriers,' as at Hazareebaugh.

One may safely say that when the sick are able to bathe in India, it is a sufficient test of their being able to leave hospital, as has indeed been discovered to be the case at some home stations.

At Nynee Tăl the sick bathe in the lake. Darjeeling says, 'in fact the inducements to remain dirty 'are, especially in the case of sickly men, greater 'than those to be clean.'

There does not appear to be a single well-placed orderlies' or nurses' room in any of the hospitals, from which the sick can be seen at all times, and where the nurses themselves can be inspected. The surgeon's and 'nurses'' quarters are sometimes three-quarters of a mile or a mile off, so that they (the medical and nursing attendants) are represented as spending their whole day in going backwards and forwards on the road.

The hospital is generally surrounded by a 'high 'prison-like wall.' At Ghazeepore it is said '*of course* 'all the buildings generally are most unsuitable for 'hospital purposes.' Proper ventilation is represented, as at Baroda, as 'next to impossible.' At Kolapore the rain beats in through the cowls, and 'makes the wards so damp that charcoal has to be 'used to dry them.' The water for drinking may be brought, as at Bangalore, from a tank which receives the whole sewage of the cantonment, and which 'just 'now is not very clean,' from which 'hundreds of 'bullock loads of impure matter are removed year 'after year, when the tank is low, and the smell from 'it most offensive.' Or the water may be brought (cholera also being brought with it) from wells into which the said tank drains. The drainage may be by an open ditch into the tank, whence the hospital derives its water. Or the water supply may, perhaps,

have to be carried from half a mile off, or even from two miles off, as at Madras. But 'no improve-'ment is required in this respect.' (!) The privies are everywhere either 'highly offensive,' or 'not more 'offensive than the best of such places usually are in 'this country.' Or the privies are 'without seats,' and are 'kept pure by burning salt in them.' 'Arrangements admit of improvement.'

Scarcely ever is there any provision of separate wards for convalescents; although, in a country whose scourge is dysentery, to leave men convalescing from dysentery in the same place and under the same circumstances as those suffering from dysentery is just to ensure as far as possible their *not* convalescing. The same may be said of fever and of bowel diseases generally. Convalescents pass their whole 24 hours in bed, except during their time of exercise (*where* they have means of exercise) on elephants, in sick carts, or doolies. They have not even a room to take their meals in, but eat their food upon their knees, sitting on their beds, 'possibly with dying men 'around;' or they are sent to barracks, and put on barrack rations, and 'marched out under a non-'commissioned officer morning and evening for 'exercise.'

Where there is no guard house the 'men on guard 'occupy a corner of the hospital verandah, where they 'eat, drink, and smoke at their discretion.' No hospitals have dining rooms, although all ought to have them, because of the pest of flies in India. Not one has a day room for men who can leave their beds.

The 'sanitary state' is generally represented as 'good,' although at the same time we are told, as in certain cases, that the hospital is 'unfit for accommodation of European patients;' or that 'epidemic 'disease has appeared in it;' that 'sores become 'erysipelatous;' that, as at Bangalore, 'one of the 'flags' in the floor being removed, 'the smell from the 'opening was so offensive that' the surgeon was 'obliged to run;' that 'gangrene and phagedæna 'have appeared, when the hospital was crowded;' that 'the privy is a nuisance to one ward;' that the 'cesspools are always more or less offensive;' or that the 'outhouses are in a very dirty and un-'washed condition.' At Muttra the contents of the latrines are 'carted away every morning for com-'bustion in one of the many brick kilns which 'surround the station, and help to poison the air.' At Madras the 'sanitary state' is called 'good,' and the commander-in-chief himself adds, 'if the vile stinking 'river Kooum were not under the very noses of the 'patients.' Both cholera and gangrene have appeared at times in the hospital. The latrines are placed to windward 'unfortunately;' 'tubs only are used.' The privy is washed daily, and charcoal burned 'in it.' It is called 'not offensive,' the commander-in-chief again adding, 'a year ago it was odiously 'offensive.'

No wonder that it is stated, as at Bangalore, that 'sick men are reluctant to come into hospital from 'barracks,' and that the medical officer does not want 'convalescent wards,' because he finds it better to

send his convalescents to barracks, where they recover faster.

From some hospitals the 'impurities' are removed by hand carriage to 30 yards from the hospital. In another, the privy is said to be a 'disgrace to the 19th 'century.' One wonders to what century it would be a credit.

At most hospitals the bedsteads are of wood instead of iron, and the men break them to pieces in their 'efforts to expel the vermin.' As at Ramandroog, where men are sent for their health, 'the building swarms with 'bugs.' And so of every barrack and hospital where these wooden bedsteads are used. One surgeon complains of the serious injury to his sick occasioned by want of sleep from vermin. The bedding is of hemp or straw, instead of hair. Hair it ought always to be in hospitals, and hair is now the regulation in all Queen's hospitals. It appears from several reports that sheets are not provided except for dysentery and fever: and certainly in no hospital deserving the name should the inspector-general feel himself called on to recommend that 'a good mattress, a 'blanket, *sheets*, and pillow-cases should be provided 'for every bed,' as does the excellent inspector-general of the Madras Presidency.

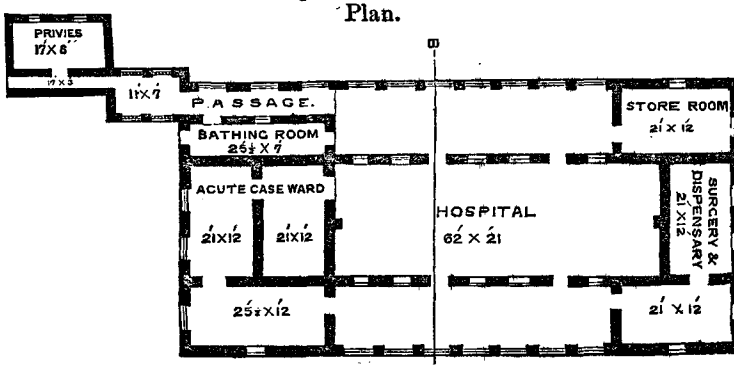
Figs. 9, 11, are illustrations of the smaller class of regimental (British) hospitals. Fig. 9 shows the simpler form of construction, a single large ward, partially enclosed by other rooms for sick, all communicating and having a common ventilation, the arrangement good and simple up to a certain point,

and then marred in the details. There are privies in place of water-closets, with covered passages, to conduct foul air to the sick in certain states of the wind. Bangalore gives a reason for 'the covered way to the 'latrines,' which we never should have thought of: 'it is a covered place for exercise.'

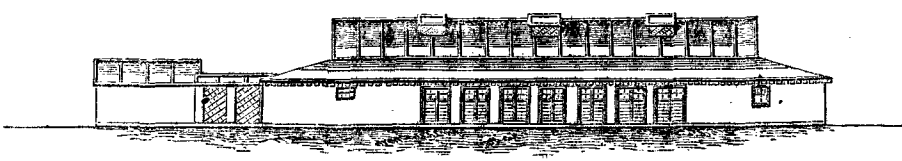
Fig. 9.

HORSE ARTILLERY HOSPITAL. BANGALORE.

Plan.



Elevation.



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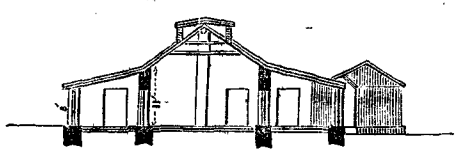


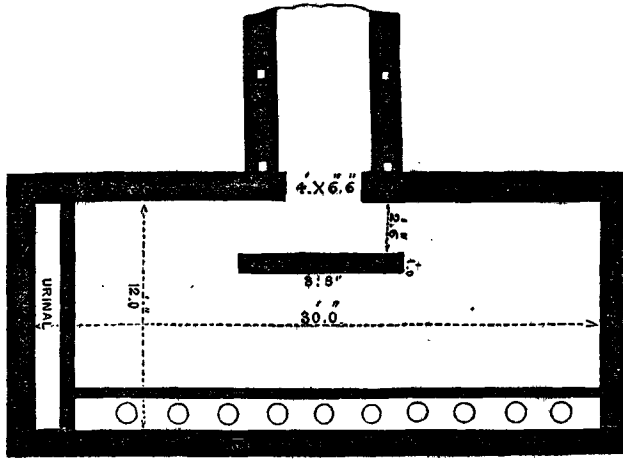
It will be seen that the hospital is entirely destitute of proper ward offices.

Fig. 10 shows the privy arrangements in plan and section. There is no drainage ; the contents are carried away by hand.

Fig. 10.

EUROPEAN INFANTRY HOSPITAL PRIVY. BELGAUM.

Plan.



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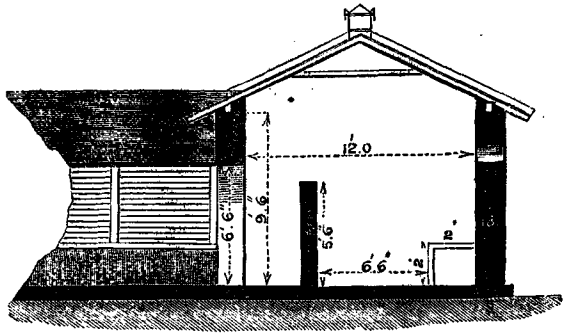
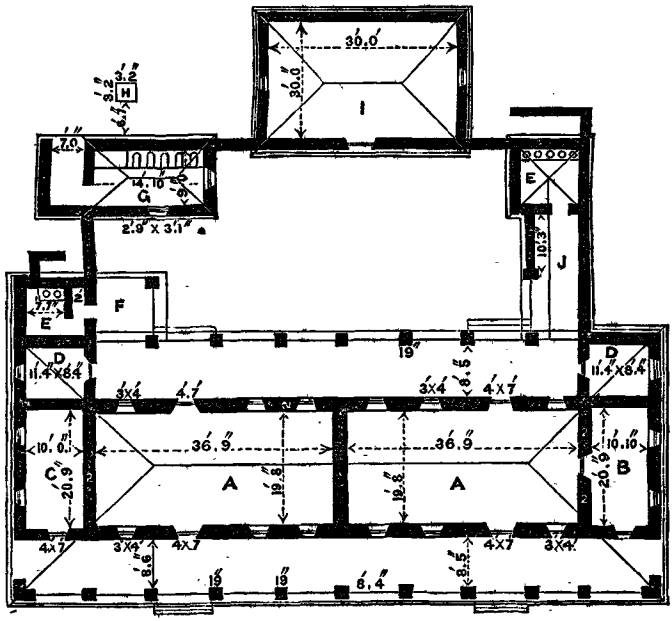


Fig. 11 shows a somewhat better construction of hospital, but there is the same defect in detail.

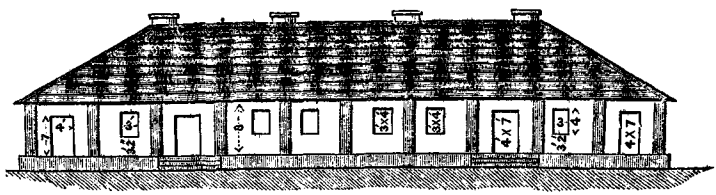
Fig. 11.

ARTILLERY HOSPITAL. BELGAUM.

Plan.



Elevation.



Either plan might answer for temporary camp purposes, in default of better, but that is all.

Indian hospitals generally, so far as all conveniences and comforts are concerned, appear to be simply camp hospitals; good, because the best pos-

sible for field service, but by no means good or the best possible for permanent stations.

There is no instance, except at Wellington, where the hospital, if on one floor, as is usual, is raised from the ground with any current of air beneath. These hospitals are stated, as at Bangalore, to be 'always damp in wet weather.' And often the floor is merely the ground bricked over. Rangoon and Tonghoo live like the beavers, and raise their barracks and hospitals on piles, with free passage for air underneath. The consequence is, that in those jungly swamps, they are more healthy than at most other Indian stations where the men sleep close to the ground.

As at Allahabad, Barrackpore, Dinapore, Meerut, Kurrachee, and Secunderabad, vast wards of from 100 to 150 beds, and even up to more than 200 beds, exactly the same as the barrack rooms, are in use.

The wards can never be said to be light or airy; 'as a general rule, hospitals are badly lighted and 'gloomy;' doors are more common than windows. And these doors, when closed, leave the ward, if not absolutely dark, yet absolutely dismal and close. Indeed a dark ward must always be a close ward. Or 'light enters from a couple of panes in the doors 'near the top, and when closed darkness is almost 'complete.' There is in Indian hospitals hardly a room light enough to perform a surgical operation. And operations, it is stated, have to be performed in verandahs.

The inner verandahs are generally used for sick wherever more room is wanted: the outer ones sometimes cut up for lavatories, destroying what ventilation there is.

The superficial area per bed is almost invariably too small, and the wards almost as invariably too high; the result to the sick being that, with an apparently sufficient cubic space, the surface overcrowding is excessive. One of the worst examples of this is the recently constructed hospital at Trimulgherry (Secunderabad), which consists of three wards, two of which contain no fewer than 228 beds each; the wards are 42 feet high, and afford 1,001 cubic feet per bed, but the surface area per bed is only 24 square feet. This surface overcrowding is greater than I have ever seen it in the smallest or the largest temporary war hospitals. Such facts strike one very forcibly in connection with the high mortality among sick entering these and similar hospitals.

All the defects of barracks reappear, and with worse consequences, in the hospitals: viz., bad water-supply, bad ventilation, no drainage (Ferozepore says, 'drainage not necessary'), offensive latrines, so offensive indeed that the patients have sometimes to leave a particular ward, no means of bathing, and hardly any of cleanliness.

There are besides, however, two grave defects not felt in barracks, but peculiar and fatal to hospitals.

These are the cooking and the attendance. It is in several reports complained that under the present system the cooks (natives or Portuguese) are nothing

but 'miserable pretenders,' because the pay is so small; that the kitchens are no better than, but just the same as, the barrack kitchens. They are often small open sheds, without chimneys, the smoke finding its way out as it can, and with but few utensils; sometimes the food is prepared on the ground. 'But we are accustomed to this in India.' It is added that, though common food is tolerably well prepared, there is nothing whatever that can be called sick cookery, nothing whatever to tempt the appetite or spare the digestion of the sick man, whom the hospital is for.

In hospitals at home, trained cooks of the army hospital corps are now in charge of the cooking, under the direction of the purveyor, who is responsible that the diets are properly cooked. In India the chief quality in native cooks appears to be the 'pursuit of cooking under difficulties;' their ingenuity in bringing about an *apparently* good result, in a rude and often bad way, is frequently admired by the reporters, as if the end of cooking were 'to make 'a pair of old boots look like a beefsteak.'

In England, where the grass-fed meat is so much better than in India, it is found necessary to put the purveying of meat for hospitals under the charge of the purveyor, for the sake of always obtaining the best quality.

There does not appear to be any provision of this kind in India, where all is under the commissariat.

As to the attendants, they are just the same as would be supplied to idle healthy men. Quantity,

it would seem, is supposed to supply quality. In serious cases a 'waiting man' is supplied 'from the 'battalion, who is relieved daily.' That is, he goes on guard for twenty-four hours, as in the guard room, so in the sick room. It appears that mounting guard in the sick room is disliked, and the guard sometimes neglects his patient.

As to supposing that any nursing is required, the thing is totally out of the question. There are neither trained orderlies nor female nurses.

A matron is sometimes 'sanctioned,' but 'only for 'a complete battalion.' If there are fewer sick they must do without. Every severe case, as has been stated, is allowed to have its comrade to itself in from the ranks—i.e., the case which requires the best nursing is to have the worst nurse. Something more is needed to make a nurse, as well as a surgeon, than mere kindness. Wherever the above comrade-practice is found, we know beforehand that there can be no nursing, no discipline in that hospital, and any amount of drink.

There is generally one hospital serjeant and a 'plentiful supply of ward coolies.' The hospital serjeant is for discipline, and under him are 79 coolies and bheesties in cold weather, 240 in hot weather. This for an European corps. The general impression, as regards the native attendants,* is that they are in

* And here comes in again the difficulty of difference in language. Our men dislike and despise the natives, and are regarded by them in return more as wild beasts than fellow creatures. The native, however, makes much more effort to

some sense kind, but 'as a rule, very inattentive;' and when there is any pressure of sick they are 'lazy,' and 'apathetic,' and the sick, it need hardly be said, neglected, and 'averse to be waited on by 'them.' When at a hill station, as Landour, the hospital serjeant is taken at random from the sick men themselves, sent up for convalescence, it is needless to point out the consequences. This grievance has been repeatedly represented, but in vain.

Nynee Täl has one hospital serjeant, one barber, one orderly, for its attendance.

Lady Canning introduced female nurses at Allahabad, who are mentioned (in the Stational Return of Allahabad) as being a great comfort to the sick. Wherever there are general hospitals there should be female nurses, but only under the organisation laid down by the Medical Regulations of October 1859. It is a great mistake to put down a few women

learn the Briton's language than does the Briton to learn the native's. It is difficult to give an idea of the evil effects of the gross ignorance of all that relates to the country in the ranks of our army in India. The commonest attempt at conversation gives rise to feelings of impatience and irritation, too often followed by personal ill-treatment. Where the Briton is sick, it is, of course, worse.

To enable our soldiers to hold ordinary intercourse with the people among whom their lot is cast, is the first element of an useful and happy life for them in India. Every soldier should be required to learn something of the native language. And a somewhat higher voluntary standard should be fixed, the inducement to attain which should be:—1. A specific pecuniary reward; 2. Eligibility for employment in the various departments of the public service.

among a parcel of men (orderlies and patients) without exactly defining the women's duties and place.

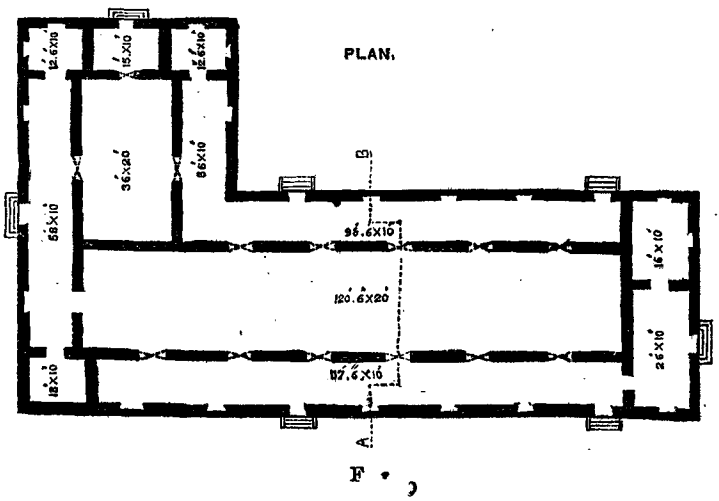
Lastly, there appears nowhere in India to be provided any means of drying hospital linen, even during the rains. It is often complained that the washing is very bad, and that the native washermen tear the linen, and at one cavalry hospital this keeps two tailors constantly employed in repairing the rents and injuries; for native washing is done by beating the linen against large flat stones or wooden boards.

If the British military hospitals are such, what must be said of those for native troops? Here the patients 'diet *themselves*.'

As regards construction, where native hospitals have been specially built, they resemble the smaller

Fig. 12.

KURNOOL FORT HOSPITAL. (NATIVE.)



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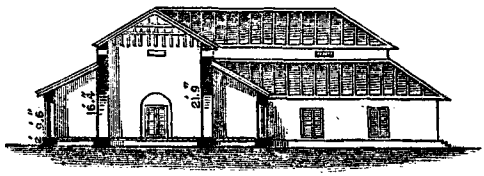

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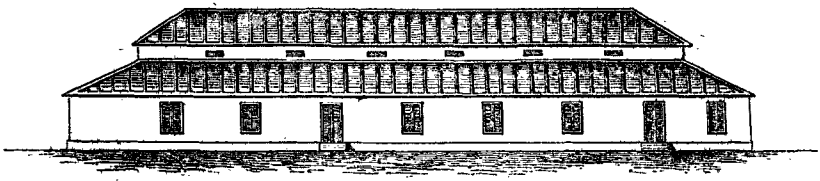
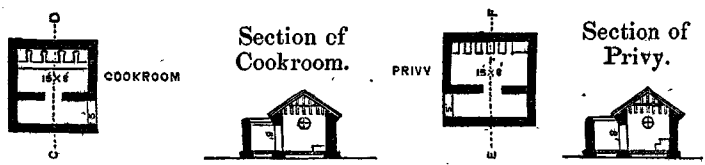




class of British hospital. One of the most complete of these is shown in Fig. 12, p. 65. There are wards within wards, completely enclosed by other rooms, of which, although there are plenty, not one is suited for ward offices.

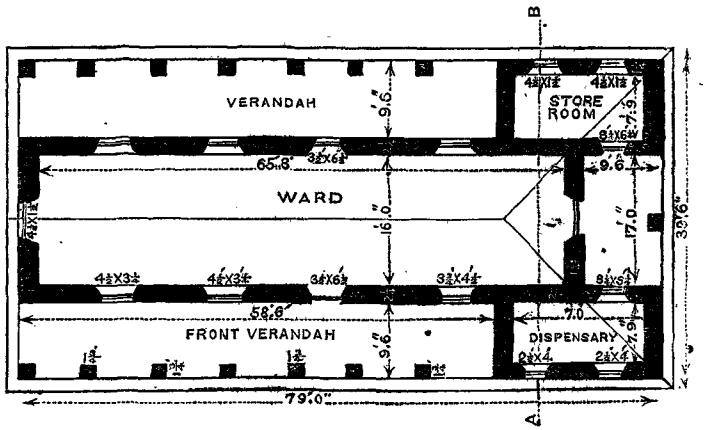
Fig. 13 exhibits hospital construction reduced to its most extreme state of simplicity. It consists of a single ward, with a few square holes on opposite sides, apparently without any glass. No ventilation and no ward offices whatever. But there is a dispensary and store-room exactly where they ought not to be.

But it must not be supposed that native hospitals are all as good as these. They are generally nothing

Fig. 13.

NATIVE INFANTRY HOSPITAL. KULLADGHEE.

Plan.



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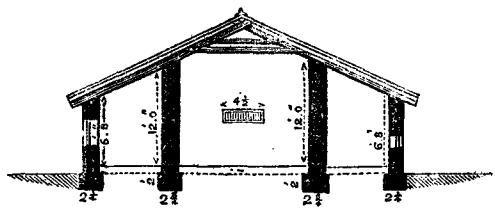

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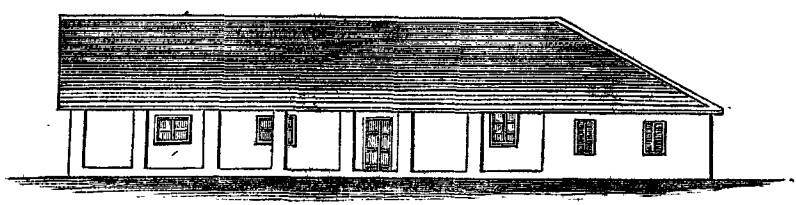


but a shed, perhaps a 'gun shed,' or a 'cattle shed,' as at Kolapore, converted into a hospital, where the sick receive nothing but medicine. The patients

cook their own diets, eating and drinking what they please. Or when too ill to cook for themselves, an orderly friend is detailed for the purpose. There are no conveniences; sometimes the sick go home to wash, or bathe themselves in a tank. Such are the 'ward offices usually provided for these establish-'ments.' In one native infantry hospital at Secunderabad it is stated that hospital gangrene frequently occurs from overcrowding, from the cachectic state of the patients, *owing to the unhealthy character of their lines*, and from a cesspool in the hospital enclosure, which last is, however, being remedied.

At Rangoon, it is stated that the privies, for native regiments, are built of matting, 'which is 'most objectionable, as allowing the escape of 'noxious effluvia.' Is it then desired to keep the 'noxious effluvia' *in*?

It is supposed that 'caste' prejudices are such as to prevent native hospitals being properly built, and supplied with requisites for sick. But this has to be proved by giving natives a properly constructed and provided hospital. There are plenty of 'caste 'prejudices' in this country against good hospital construction; but good hospital construction advances nevertheless.

At Loodiana, one native doctor, one coolie, one water carrier, one sweeper, are the attendants 'sufficient for the ordinary wants of the sick.' The present arrangements for the female hospital are said to be 'sufficient' (which means *none*), (Loodiana is now a native station).

VII. Hill Stations.

Sir Ranald Martin wisely and strongly urges that the whole subject of hill stations should undergo a thorough revision, for the purpose of deciding whether a portion of the army could not be always taking its turn as a reserve on the hills, thus to preserve its stamina.

Children, too, might be reared as well on the hills as at home. One of the native chiefs going over the Lawrence asylum (of 500 children) at Sunnawur, said to Sir John Lawrence that they looked like lion's cubs.

It strikes one, however, that it would not be safe to depend for improvement of the health of troops solely on occupying hill stations, with such an overwhelming amount of evidence as to the bad sanitary state of the stations on the plains, and even of not a few of the hill stations themselves, such as Darjeeling, Landour, Nynee Täl.

'At some hill stations there is malarious fever; 'others predispose to diarrhœa.' The barracks and hospitals at Kussowlie and Subathoo are defective both in plan and in structure. At Mount Aboo they are 'bad barracks,' built in a 'malarious gully,' and the men return suffering from intermittent fever and from scorbutic disease, the result of want of vegetables. Will it be credited that, at one of the two hill stations of the Madras Presidency, the privies are built on the edge of the hill, in order that the natural slope may save us all the trouble

of sewerage, the lavatories the same, which are emptied by 'upsetting the tubs' down the hill; and that, at the other, with more than 900 men, the barrack square was an immense swamp for want of drainage. Low fever, from March to May, from which the men have suffered who were sent there for health, is attributed to this, as if it were a meteorological observation. This refers to Wellington on the Neilgherries. Indeed the Neilgherry stations, the best in India, are in great danger of being permanently injured by sanitary neglects.

In fact, all that the hill station evidence proves is that healthy men, put under healthy conditions, will remain healthy, and *vice versâ*.

Hill stations, it is said, are highly favourable to troops arriving in *health*, IF lodged in good barracks; are unfavourable in some states of disease. Dry, spacious, well-ventilated barracks, in well-chosen positions, drained, supplied with wholesome water, and out of the way of nuisance and malaria, have been the great want of hill stations. And want of fresh vegetables and of pure water has produced much mischief. In the rains, the water is often loaded with 'rotten vegetable matter, causing 'diarrhœa.' [Is this supposed to supplement the *want* of vegetables?]

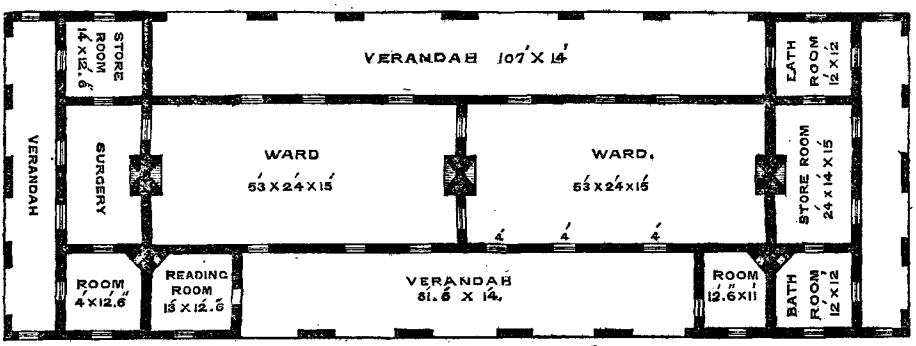
High authorities advocate sending certain invalids to sea-side sanitaria.

Hospitals at hill stations appear to be very much on a par with hospitals at plain stations, as far as can be learnt from Fig. 14, which represents the

hospital at Darjeeling used for sick of the depôt. The arrangement is much that of a field hospital, with fire-places to suit the climate. At this hospital an open privy was placed in one corner of the verandah, which compelled the sick to evacuate the ward, and it took five years' writing to get it removed.

Fig. 14.

JULLA PUHAR HOSPITAL. DARJEELING.



Hill climates, judiciously used, would no doubt be of great value. But they are by no means all that is required for the salvation of the Indian army. This must be brought about by sanitary measures everywhere, of which hill stations, if kept in a good sanitary condition (but not if kept in a bad condition) are one. This is the unquestionable result of the evidence.

When our troops went into a notoriously unhealthy district in China, they were not placed on hill stations. They were properly managed, and

their sanitary condition provided for; and they had no larger proportion of 'constantly sick' than the troops at home.

VIII. Native Lines.

Native troops have no barrack accommodation, no doubt a most excellent thing for their health. They have hutting money (very little), and make their own huts, which are so badly built as to ensure thorough ventilation, being often indeed only open sheds in compartments. But little or no pains are taken to make them put up these huts in any regular order; they are crowded, or rather huddled, together and without drainage of any kind. They are always damp, and the men always sleep in malaria. When they have families the huts are too small, because the hutting money is too small.

Native troops have no rations, and stint themselves of proper food in order to hoard their pay.

They are almost invariably temperate, and have little or no liver disease, whilst the British troops are decimated with it. So far as can be learned from disease statistics, native troops are far more moral than British.

Except schools, no means whatever of instruction, occupation, or amusement are provided for them.

They are, in fact, stipendiaries receiving a day's pay for a day's work, with their uniform, but they are not what we should understand by troops provided for by the State.

With regard to every appliance of civilised life, the tale is even more absolutely *nil* than for British troops. There is absolutely no drainage or sewerage, no latrines. And the descriptions of what the surrounding country and bazaars are in consequence are absolutely impossible to repeat.

There are no lavatories nor baths.

There are no kitchens.

There is no sanitary police.

At Mangalore, one of the best of the native stations, 'surface cleansing has hitherto been per-'formed solely by the heavy rains.' At Quilon, another, there is (as usual) no drainage, but ruinous buildings, harbouring the dead carcases of animals, and 'on one occasion, of an old woman.'

The water supply is of course as bad as, or worse than, at European stations.

At Kherwarrah, in Bengal, the water 'has not 'unfrequently a filthy taste, and disagreeable organic 'smell.'

The degree to which native troops almost everywhere suffer from guinea worm would alone tell us what the water is. At this same Kherwarrah, one in every six has suffered (for 17 years) from guinea worm.

There is no 'conservancy' establishment for cleanliness. At this same large station of Kherwarrah, 'this is left very much to the jackal, 'vulture, and carrion crow' (beyond the lines). There are patrols to prevent nuisances, 'except in 'specified localities.' The lines are kept clean,

but the 'sweepings are deposited 30 yards to 'windward.'

The most ordinary sanitary precautions are not taken. 'Every family has its own cesspool; dung 'heaps close to every hut,' also holes for ordure. Animals are slaughtered to windward. The offal is thrown to dogs, jackals, and vultures. During the rains the stench from the offal, the increasing accumulation of years, is sometimes dreadful.

The native population is 'decidedly unhealthy,' from jungle, swampy ground, cramped, damp dwellings (which shelter sheep, goats, and cattle, as well as men), bad food and water, neglected cesspools, middens, exuviæ of men and animals, absence of drainage, opium eating, &c.

What wonder if native troops suffer from quotidian, tertian, quartan, remittent, and typhoid fevers (which alone constitute two-fifths of the sickness and cause one-fourth of the deaths in some places), from acute and chronic dysentery, from sporadic and epidemic cholera, from simple and confluent small-pox, and from acute and chronic rheumatism!

The intelligent medical officer of Kherwarrah imparts a very important secret as to the unhealthiness of Indian stations when he says that none of them have had 'fair play' (not even such large British stations as Dumdum, Barrackpore, and Dinapore), owing to the 'utter disregard of the 'commonest sanitary precautions.'

At Cochin, in the Madras Presidency, the water is unfit for use from privy infiltration. Drinking

water is brought daily 18 miles. One tank is used for bathing and drinking. The sanitary condition of the bazaar is 'as bad as it can possibly be.' 'Cleanliness is unknown.' There is 'no drainage.' The 'streets are used as privies without hindrance.' No regulation for cleanliness is attempted. The old rampart was converted into a ditch, now used as a public privy. Every odd corner is 'in the most 'disgusting condition.'

Rajcote, in the Bombay Presidency, might give similar instances of more or less neglect. But it is needless to follow this subject further. Everywhere there is the same ignoring of natural laws, and the same penalties of disease and death.

The hospitals, again, combine all the disadvantages of civilisation without any of its advantages. In one place the hospital was so overcrowded that for two years 'gangrenous and spreading sores' were 'frequent.'* Another hospital was so much out of repair that 'it would before long be a ruin' (the best thing that could happen to it). If there is a privy, it is a 'small room, with no place in which the excre-'ment can go to be cleared away.' If there is a lavatory or bath, it is 'two tubs out of repair' (does that mean that they cannot hold water?) If there is a kitchen, as at Mercara, it is under the same shed as

* Labuan says that its hospital is much larger than 'the 'strength is entitled to,' but that 'frequently the number of 'patients far exceeds the number of beds,' and the 'extra' sick (60 in a strength of 161!) 'have slept on the floor between each 'bed, and some in the verandahs.'

a privy, and cannot be used for the stench. Indeed, the medical officer proposes that it should be turned into a privy. The sick generally cook under the nearest tree, and if unable to do so, a comrade cooks for them under the tree. Linen is washed and dried by caste comrades, or by the patients when not too ill. Each patient brings in his own bedding; generally his own bedstead. 'Each patient defers bathing, 'according to custom, till he is cured, when he retires 'to the nearest well, draws water, and undergoes the 'bath of cure,' i.e., when he no longer wants it. Every report begs for a bath room.

The general construction of native hospitals has been described under the head of 'Hospitals.'

IX. Native Towns.

The description given of the native towns is astonishing.

Can it be possible that such a state of things exists after all these years of possession and unlimited authority?

So far as one can judge from the evidence, the sanitary state of entire large cities is as bad as, if not much worse than, was the state of the worst parts of our worst towns before there was any sanitary knowledge in the modern world at all.

What, for instance, is to be thought of the following?

At Bangalore, a station 3,000 feet above the sea, with the climate of a hill station indeed, and quite as healthy as any in Europe, where we have 1,700 men, we have allowed to grow up within our cantonment a

native population of half a quarter of a million, without any of the arrangements of civilisation whatever. Houses, tanneries and slaughterhouses are crowded together without any plan. There are no public necessaries. The natives resort to open spaces. The Ulsoor tank, which may be said to be the receptacle of the sewage of the whole place, including our barracks and hospitals, is used for drinking. In dry seasons, the tank itself is a great nuisance. Even the wells are poisoned, 'owing to the amount of filth 'percolating into them from bad drainage.' There is a dirt heap at almost every door. In the better houses, where latrines exist, there are wells sunk in the ground within the house, which are closed up when filled and others opened. The filth from the cowhouses flows into open drains. There are no arrangements for stabling the bazaar horses, which with other domestic animals are kept *in the houses*. This bazaar is all close to our own barracks ; and it is said that now nothing short of removal of the one or the other will remedy the evil. There is nothing, therefore, to astonish us in the fact that in this, one of the healthiest stations and climates in the world, the mortality of our European soldiers should have been 129 per 1000 * (including cholera) in one year.

In Hyderabad, not far from our largest Madras station (Secunderabad), all the promoters of zymotic diseases are at work, and cholera, small-pox, diarrhœa, and dysentery are, it is stated, the most common of these.

* Dr. Macpherson's Report on Madras Presidency, Dec. 27, 1860.

But the capital of the Madras Presidency is, perhaps, the most astounding. Its river Kooum is a Styx of most offensive effluvia. The air in Black Town and Triplecane is 'loaded with mephitic effluvia at night.' The atmosphere around Perambore and Vepery is 'perfectly poisoned.'

At Kamptee, with its 70,000 souls, 'all filth is 'thrown into pits in the streets (!) of the cantonment.' The poorer houses are huddled together without order, on ground intersected by nullahs, making the houses difficult of access. The cesspits, 'where accessible,' are cleansed every 24 hours. The next information is curious. 'Persons committing nuisances are 'closely watched and taken up daily.' At Jaulnah there are no dungheaps nor cesspits 'outside at least.'

The native population around Fort William, Calcutta, is peculiarly unhealthy; fevers of all kinds, cholera and fatal diarrhœa are 'remarkably preva-'lent.' The causes are 'bad overcrowding,' 'bad 'drainage,' foul drains, rank jungle, stagnant water, bad unwholesome drinking water, filth.

At Ahmednuggur it is acknowledged that almost every epidemic in the cantonment has its origin in the crowded, ill-ventilated, and dirty village of Bhingar (of 3,000 souls). The town itself of Ahmednuggur, with its 36,000 people *and no latrines*, uses 'the 'very boundary of our camp' for this purpose, and 'the smell of ordure is very perceptible.' At Poona, where there is a city of 80,000 people, three-quarters of a mile off, a bazaar of 27,000, quite close, a village (Wanowrie) 100 yards from officers' lines, where

cholera first arose, there is the same story about 'no 'latrines,' 'conservancy' establishment far too small for the daily removal of filth, and nuisance experienced in barracks from this cause. Belgaum says of its bazaar that there is 'no want of cleanliness,' *and* 'that the public privies and cesspools are at times very 'offensive.' The town, with 18,000 people, is between the fort and the camp. It affects the general health of our station from its 'bad conservancy.' But, again, we are told there is 'no want of cleanliness!'

At Kolapore, '*one* sweeper is maintained by 'Government' (for the bazaar), who collects the filth and throws it into a nullah, 400 yards from camp, which is also the public necessary; 'two peons' prevent nuisance being committed in camp 'from 4 to '10 a.m. daily.' At Bombay, with a town of from 400,000 to 600,000 souls, there is a municipal commission, with sanitary powers, and the result of its practical labours is as follows:—Native houses generally in a filthy condition; much ordure within precincts of buildings, where it has been accumulating *for years*; native town proverbially unhealthy; nuisance, from wind blowing over it, experienced in Fort George and town barracks; washermen's tanks particularly obnoxious; sight of slaughter-house as bad as can well be; sea breeze cut off by bazaars, &c. &c.

Dung heaps are a 'never-failing condition of native 'life in India.'

At Baroda, the military hospital is close to a nullah used as a 'necessary' by the natives, and as a

'receptacle for the filth of the whole station.' When cholera occurred, the hospital had to be evacuated. And yet it is added, with great *naïveté*, the "sanitary 'recommendations of the medical officers are always 'attended to.'

At Dinapore the native towns are 'disgracefully 'filthy,' with 'holes near all native houses.'

At Cawnpore there is overcrowding and want of ventilation, with all manner of filth.

At Peshawur the streets are dirty, the houses densely crowded and ill ventilated. The population suffers from a 'severe and fatal' typhoid remittent fever, which rises to an 'epidemic' in certain districts, also from epidemic small-pox, &c. &c.

At Ghazeepore, in the latter months of 1859, there was a 'fearful' fatality from 'fever,' due to a total want of sanitary arrangements.

At Berhampore there seems to be scarcely any epidemic which the native population has *not*. Among the causes: 'holes full of stagnant foul water, 'close to almost every house, forming the usual cess-'pool of the neighbourhood.' 'Utter neglect of venti-'lation and of all sanitary measures.'

At Hazareebaugh cholera and small-pox are the 'most common and fatal epidemics.'

Only the presentable flowers are here. The stational reports are a garden to which those who doubt the truth of this representation, taken as a whole, and think it merely true as to particular facts, are again referred.

The stational reports generally state the native

populations to be 'healthy,' or 'remarkably healthy,' and then give a list of every disease that flesh, *under defective civilisation*, is heir to, to which they are subject endemically or epidemically. What must be the state of health of the natives when 'unhealthy?'

One remark, or rather inference, viz. native 'caste' prejudices appear to have been made the excuse for European laziness, as far as regards our sanitary and hospital neglects of the natives. Recent railroad experience is a striking proof that 'caste,' in their minds, is no bar to inter-communication in arrangements tending to their benefit.

Sir C. Trevelyan justly says that a good sanitary state of the military force cannot be secured without making similar arrangements for the populations settled in and around the military cantonments; that sanitary reform must be generally introduced into India for the civil as well as the military portion of the community; that now is the time, for not only has the subject been worked out by actual experiment in England, but the improved financial state of India, the increased influx of Europeans, especially of engineers and mechanics, and the powers of local legislation lately conferred upon the subordinate governments, have given facilities which never existed before. The sanitary arrangements for towns will be conducted by municipal bodies, for the creation of which there is already a very good Act of the Government of India.

The mere passing of such an Act presupposes the impotence of 'caste' prejudices; and nobody who

understands the relation of bazaars and native towns to garrisons and cantonments can fail to see that the sanitary improvement of the Indian army involves the sanitary improvement and the advance of civilisation in India, a work before which 'caste' prejudices, and many other prejudices, will have to give way.

X. Absolute Perfection of Causes of Disease.

Our experience at home as to the results of sanitary improvement on the health of the army affords every reason to expect a very great improvement in the health of the Indian army, if proper sanitary measures be carried out. And it would require very strong evidence indeed to convince the people of this country that the epidemics which have devastated India arise from any other causes than those which the stational returns and the evidence prove to exist in what one may call a state of absolute perfection in the Indian towns, but which have been removed with entire success in this country.

XI. Soldiers' Wives.

'Leave to marry' in the British army means that those only who marry with consent of the Commanding Officer have a claim to quarters in barracks. The proportion of quarters allowed by regulation at home is 6 married men per company of 100, in addition to married serjeants. When going to India,

12 married couples per 100 men, together with a proportionate increase of wives of serjeants, are allowed to go with the regiment, a number which high authorities consider too small. There is a general opinion that the proportion of married people allowed to go to India should be raised. The question is mainly one of sea transport and barrack accommodation, neither of which would be very costly as compared with the benefits to health and discipline which all agree would result from increasing the number of married men, always the steadiest, most temperate, and best behaved in the regiment.

Throughout India, however, there is better provision of 'married quarters' generally than on home stations. At most places they are reported as 'sufficient,' at some 'insufficient,' at others 'very bad,' and at a few there are none. Where they are insufficient or non-existent, the 'married 'quarters' are men's barrack-rooms or huts, divided off by curtains or partitions. Only at a few places are married people placed in barrack rooms with unmarried soldiers, still this practice does exist. One of the consequences of 'allowing' marriage in the army is certainly that decent healthy quarters should be 'allowed' too. No time should be lost, for this is especially necessary in India.

In the matter of soldiers' wives there are two instances of striking contrasts (each happened during the Mutiny); one, the destruction by dysentery of 64 wives and 166 children of British soldiers at Dumdum; the other, a request made to and complied

with by Sir John Lawrence from an officer of a native regiment of guides regarding the native wives. 'Mind you look after these women carefully, 'and do not let them be in distress; several of their 'husbands, men of rank, have been killed.' The request was loyally fulfilled, and as loyally appreciated by the men.

At Dumdum 554 women and 770 children were crowded together without care or supervision, and the proportion which fell victims to intemperance, immorality, filth, and foul air was more than six times, in either case, the ordinary mortality of women and children in Bengal. The fathers and husbands were fighting or dead in our battles. This massacre killed as many as it is supposed fell by the hands of the mutineers.

It is singular that in no one part of the Dumdum report does the slightest allusion occur to this tragedy, making one think that it cannot be an isolated case. And it appears to have arisen solely from the absence of any regulation as to the care of soldiers' wives and children in the husbands' and fathers' absence. Families go to India, and as long as the regiment remains fixed things may go on pretty well, provided there are decent separate quarters and a careful, kindly commanding officer. But send the regiment on active service, and there is no way of caring for the families. They take their chance under circumstances where they *cannot* help themselves. Or they are all huddled together, as at Dumdum, with this result, that while the

husbands were punishing the murderers of English women and children in the upper provinces, their own wives and children were being destroyed in vast numbers, for want of care. Why?—Could it not be made a necessary part of army arrangements to appoint a 'picked' married officer to act as guardian over these women and children, to see to their comfort and conduct, to their being properly lodged and cared for? The manner of providing for them out of their husbands' pay is a matter of detail easily settled. If only anyone will take the trouble to do it, the thing can be done. But more than this, it should be made matter of regulation throughout the whole service. There should be personal responsibility somewhere. At Dumdum nobody was held responsible, and nobody was punished for the result. If one-tenth of the calamity had happened in England, there would have been coroners' inquests over and over again, and public opinion, if not law, would have punished some one. At Dumdum the enquiry took place after the destruction of human life had been going on for months.

Sir John Lawrence expresses forcibly his practical opinion that there should be a 'system' treating the 'men as so many children,' in binding them to 'remit' money for their families, but also providing guardianship for those families when the 'regiment 'is going on service,' and so averting the 'terrible 'results' of 'abandoning the wives.'

Why cannot what was done for the Sikhs by Sir

John Lawrence be done by regulation and on system for our own country people?

There are shocking illustrations of how soldiers' wives and children fare when the men are on foreign service, and how a man does not become a better soldier for knowing that his country does not care for his wife and children while he is risking his life for his country. To the extent to which marriage is allowed in the army should all its necessary consequences be acted out.

But so far from this being done, the principle everywhere has been the reverse. Even as regards illness, in some notorious instances soldiers' wives have expressed (and justly) the strongest indignation that Government took more care of prostitutes in illness than it did of honest wives; that Government will pay to cure the prostitute to go on with her horrid trade, which destroys their husbands, and will not pay to cure the wives and children, or to make the married quarters more comfortable; and it is true, although not so applicable to India, where there are female hospitals.

Some of these hospitals, as at Kurrachee and Deesa, Lucknow, Raneegunge, and Ferozepore, appear to be very complete, with female attendants. In the Madras Presidency, they are too often, as at Bangalore, Trichinopoly, and Kamptee, merely men's wards appropriated to women, and justly stated to be 'objectionable in every way.' Elsewhere they are rather bare. Indeed, as at Baroda, Kirkee, Poona, Darjeeling, the sick women and

children 'have to be attended at their own quarters,' either because 'there is no matron,' or because the 'ward is too small,' or &c. &c. Curiously enough, it is generally stated that the 'present arrangement 'is conducive to comfort.' What arrangement? Of having no matron? While it is added, that a lying-in ward and a matron are 'much wanted.' At Darjeeling the women and children are treated in their own quarters, which 'would be satisfactory 'enough if the married quarters were not so dark 'and damp as they are.' Sometimes it is said that 'the arrangements are quite equal to those for the 'men.'

The construction of these hospitals appears to be the same as that of small regimental hospitals.

The following plan and section of a female hospital at Meean Meer (one of the most recently built in India) shows that they require quite as much structural improvement. It is a nest of rooms within rooms; and the same may be said of it that one of our engineers said of the Pacha's new fort on the Dardanelles, that 'he would be much safer outside 'of it.'

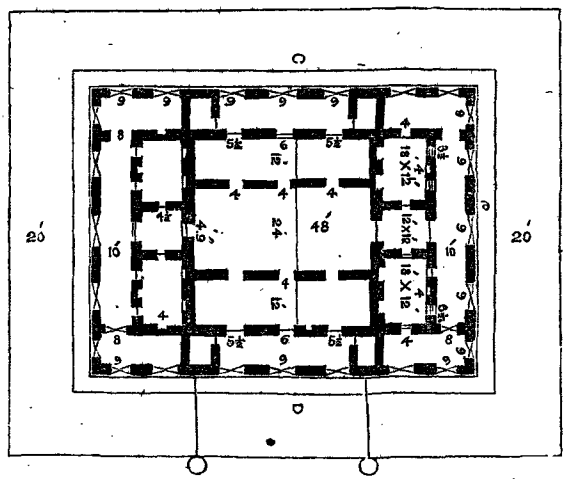
But whatever defects there may be in the hospital accommodation for soldiers' wives and families in India, at least prostitution is not encouraged, and its immorality systematically palliated by lock hospitals on any large scale, although recent attempts have been made to extend them. Lock hospitals, alas! exist—exist, I mean, and are advocated and supported on the principle of restoring the vicious to

go on with their vice, the only institution I am aware of for this purpose. (Prisons and lock hospitals in England at least aspire to reclaim the vicious.) And lock hospitals and police regulation are, alas! sometimes recommended, just as if they could do any good. At Secunderabad, it is said, a

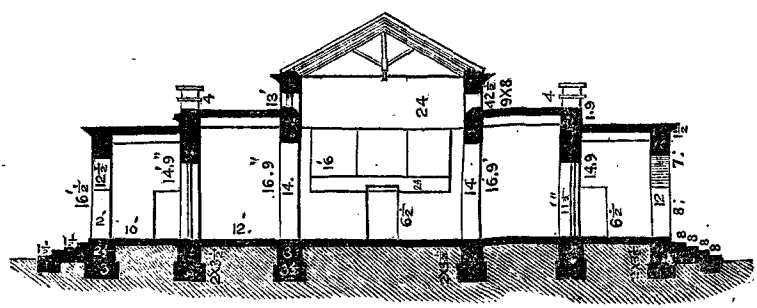
Fig. 15.

FEMALE HOSPITAL. MEEAN MEER.

Plan.



Section on C. D.



lock hospital has been long in existence, with these 'excellent results,' viz. that 20 per cent. of admissions into (military) hospital are from the disease engendered by vice, which is five times as much as exists among the native troops. On the other hand, the enlightened medical officer at Kurrachee has entered a striking protest against the present lock hospitals, and has shown how utterly incompatible at once they are with morality, and how utterly useless in practice. Indeed, common sense is the same as moral sense in these as in other things. As in the kindred vice of drunkenness, Government licenses, in order to control vice, and the soldier is more drunken than before.

Lately, in one of our own largest seaport towns, —and I understand it is not the only place where such a measure is contemplated,—I was consulted as to the structure of a hospital where Government was going to pay for 15 and for 10 beds for fallen women for the army and for the navy. These are called the 'War Office prostitutes' and the 'Admi-'ralty prostitutes.' The title is just, and therefore the less agreeable. In this same town a hospital for soldiers' wives only lately exists, although it had been long corresponded about, although several women had been confined in barrack rooms, several had had fever in consequence, and one, at least, upon testimony of the army medical officer, had died from it, as well as children.

With two, or at most three, exceptions, there is no accommodation for sick women and children at any home station.

As regards army prostitution, there is, as I have said, the same helplessness as with army drunkenness. It is apparently never considered that they are both parts of the same vice, and that, so far as human agency is concerned, they both spring from the same causes.

India has its licensed 'lal bazaars,' and its licensed spirit selling. And both are encouraged to the utmost by leaving the men utterly without rational employment for their time. The 'lal bazaar' and the canteen both send men into hospital in abundance. While, instead of confronting both evils with the strong arm, and providing men with useful occupations and manly amusements, Government sets up lock hospitals under its authority, and makes ineffectual attempts to stop drunkenness by keeping the supply of drink, as far as it can, in its own hands, and so encouraging the evil by its own authority. The authority of Government is avouched for both evils. So long as this is the case, they will extend and flourish, and the taxpayers in India and England will have to bear the cost.

XII. Statistics.

All that can be said under this head is, that the statistical abstracts of sickness and mortality for the European troops of the Indian army afford no data of sufficient accuracy to enable us to judge of the sanitary state of the troops, while they are defective in some most important data required for estimating the exact sanitary condition of the stations. Practi-

cally, these statistics are very much in the same condition as were those for Queen's troops before recent improvements were introduced. The facts may be in existence, but there are no means of rendering them easily accessible. The question of mortality and efficiency is one of even greater importance now than it was formerly, seeing that the whole British army must pass through India in the course of its service.

The only way to keep a proper check over the sanitary condition of stations is to lay their sickness and mortality statistics annually before Parliament. This can be easily done by adopting the new statistical methods and forms at present in use for Queen's troops at home and on foreign service. These should be introduced over the whole of India, and the results published every year, together with those of the army at home.

XIII. Sanitary Service.

In times past there has been no proper sanitary service in India. No doubt there has been more or less of cleanliness; because wherever Englishmen go they attend to this in one way or other. Otherwise there is just the same neglect of civilised appliances, of water supply, drainage, &c., as used to exist in unimproved towns at home, notwithstanding repeated representations made by Sir Ranald Martin, and by other enlightened professional men. In India, as at home, no good will be done unless it be made some competent person's express business to look to these things.

Even with our habits of self-government, it has been found necessary for the central government to step in and assist local progress. It is certainly of far greater importance for the government of India to do so, seeing that there is no local self-government at all.

There is, it is true, a kind of local sanitary government by commissions at the seats of the three presidencies, the result of whose labours has hitherto been that no one of those three large and populous cities has as yet arrived at the degree of civilisation in their sanitary arrangements at which the worst parts of our worst towns had arrived, before sanitary reform sprung up in England at all. Bombay, it is true, has a better water supply; but it has no drainage. Calcutta is being drained; but it has no water supply. Two of the seats of Government have thus each one half of a sanitary improvement, which halves ought never to be separated. Madras has neither. As to barracks and cantonments, it is quite evident that both sanitary medical officer and sanitary engineer need to 'be abroad.'

I am, my Lord,

Your faithful servant,

FLORENCE NIGHTINGALE.

Right Hon. LORD STANLEY, M.P.
President of the Royal Commission on the
Sanitary State of the Indian Army.

Nov. 21, 1862.

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